..THE IRON AGE..

NEW YORK, MAY 12, 1932

ESTABLISHED 1855 Vol. 129, No. 19

Engineers Plan Study to Determine What's Wrong with the Industrial System

By W. W. MACON
Consulting Editor, The Iron Age

BELIEVING that economic ills may be largely eradicated by uncovering basic faults in the interplay of commerce, finance and production, the engineering profession has undertaken a searching investigation of our whole industrial system.

Such a comprehensive study is regarded as necessary because a year of preliminary research revealed a lack of conclusive evidence for most of the charges against our economic order. While necessarily reserving final judgment on the issues under inquiry, the engineers, in their initial report, oppose extension of government control, favor retention of competition and the profit motive as a means of promoting advances, and recommend a furthering of high living standards, broadly distributed and freed from wide fluctuations.

WHAT promises to be a movement of far-reaching importance has been initiated by the engineers. It is a proposal to investigate the industrial system, or, more specifically, to learn what brought about the present unbalance in production, consumption and distribution.

The intention is to discover root evils. Therefore, the program is one of preparedness for the new order that will prevail when the present crisis has passed. Many of the measures offered today in the way of correctives are palliatives, to serve in the event of a recurrence of untoward conditions. The engineers would institute a searching inquiry to ascertain the disease and then effect its cure rather than experiment with sedatives. For example, the effort would not be so much toward establishing the best methods of caring for unemployment as toward eliminating conditions causing unemployment.

We have reason to expect much from the plan. This is so because nothing will be taken for granted. Instead, the question mark will be put to all existing practices in manufacturing, commerce and finance. The program presupposes a painstaking study of the whole gamut of human activities in business, thereby to provide the groundwork for modifications in our industrial practices.

Money will be required in a large amount to carry on the research, which must be unbiased and continued to completion with no undue haste and all under the highest authority, far removed from suspicion of special interest. Only then may there be a hope that the findings will get complete, or substantially complete, acceptance.

A reading of the preliminary report of the committee that has been considering the question for a year or more is highly stimulating. It points to an opportunity for doing a public service such as comes only at rare intervals.

Genesis of the Movement

THE committee was appointed by the American Engineering Council. This is the national engineering body that was organized a number of years ago to represent the engineer in national affairs, largely to render him articulate in matters of broad social concern. The council has been building a reputation as an arbiter in matters involving technical questions as well as a source of helpful information for legislators. Its membership comprises representatives of national and local engineering societies. In January, 1931, it took up as one of its duties the study of the relations of

consumption, production and distribution.

The committee named for the work is headed by Ralph E. Flanders, Jones & Lamson Machine Co., Springfield, Vt., an outstanding student of industrial economics. As the committee proceeded with its studies, it evidently became reluctant merely to point out the several unproved charges laid against the industrial system, but determined rather to use the results of its months of work as a basis for a deep delving into the whole complex business fabric. It has the ambitious aim to lay before all concerned such a clear picture of the interlacings of modern society that such catastrophes as violent business upheavals may be averted.

It is reassuring that the engineers do not presume that they alone can do the job. They count on other professions for cooperation, but reserve to themselves the task of doing much of the steering for two reasons. One of these, barely intimated, is that engineering, a young profession, is singularly free from hampering traditions, such as the knowing of too many things that cannot be done. The other is that industry is now so interwoven with science and technology that the engineer is accepted as a competent adviser along with the economist and the financier. He is aware of the claim widely current that he is responsible for much of today's woes, but he refuses to admit the charge without a thorough sifting of the facts.

The burden of the engineers' preliminary finding is that everything bearing on business practice needs sharp questioning and that out of it all should come a clear picture, showing the paths to be taken to prevent the periodic collapse of what we term the capitalistic system. The report contends throughout for a standard of living that is high, broadly distributed and free from severe fluctuations. Furthermore, the committee believes there must be a mimimum of government control, and it is strong for the retention of the profit motive and the kind of competition that fosters advances.

Causes of Depression Not Proved

"QUESTIONABLE or inadequate" is the committee's characterization of the popular explanations of the present economic situation. Convincing proofs are found lacking, and that is why penetrating investigation is advocated. The report covers at some length each of the so-called causes of present troubles, including technological unemployment, wasteful manufacture and distribution, general over-production, speculation, installment buying and the breakdown of international trade and credit. There is no evidence, says the report, to prove that improvement in manufacturing, processes or organization is responsible for the recession.

Instead of finding a case against technological advances, the engineers point out that the census of manufactures of the Department of Commerce indicates that there was on the whole a slow but perceptible increase in the percentage of the total population gainfully employed up to the business recession in 1929. Technological developments, the report reminds us, have been going on for centuries. "Also that the normal method of adjusting the volume of production to a general increase in the efficiency of production has been a progressive shortening of working hours."

In the matter of waste in distribution, there may be a plausible case, in that distribution has absorbed some workers displaced by improved methods of manufacture. "Doubtless the inefficiency in distribution has mitigated the severity of the problem of technological unemployment."

Overproduction, the report finds, cannot be admitted without question as a primary cause of the depression, for "the real difficulty is due to the lack of a proper balance between production, purchasing power and consumption, and not to overproduction."

Installment buying, the committee agrees, undoubtedly prolonged the unstable balance of the boom and has hindered the processes of recovery, but it believes there are "unrealized possibilities of usefulness in the extension of consumer credit, provided it is done in an appropriate degree at the proper time of the business cycle."

Advocates Long-Time Budgeting

AMONG suggested lines of action, the committee emphasizes that particular attention be paid to long-time budgeting, for government as well as for industrial management. "It is one of the new mechanisms of management which has resulted from a union of engineering and financial principles. It is not in accordance with the principles of good management for the government to attempt to balance its income and expenditure in each fiscal year. The government should recognize that in the course of a business cycle there is a time to tax and a time to relieve taxation. There is a time to borrow and a time to repay borrowing. There is a time to expand money and a time to contract it. There is a time to extend operations for public works and a time to contract them."

"The time for taxation," goes on the report, "is when business is good and profits are being made. Taxation then, if taken from profits, has the effect of reducing the amount of funds seeking investment and flowing into speculative channels. . . . By increasing taxes during one phase of the business cycle, excess savings may be decreased, and by floating government bonds at another phase an opportunity may be provided for investing savings."

The committee stresses the dictum that when the rate of savings exceeds the rate of investment, a decline in business is initiated. It urges that the proper timing and distribution of taxation, borrowing, expenditure and repayment would have a highly remedial effect on business conditions, even though the total amounts involved are not materially greater than normally.

Centralized public works control, the balance of international payments, the stabilization of money, the condition of agriculture, the government reclamation policy and decentralization of manufacture have been covered by the committee as subjects that should receive thorough consideration.

To Develop New Channels for Capital

THE committee considers it wise also to ascertain if and how a purposeful search may be made to set up a guide for profitable investments. New outlets for capital may be required to replace the railroads, the automobile, war materials and so on. Perhaps an engineering staff should be set up in each banking organization, as the committee suggests, "which staff should be as aggressive in searching for opportunities for sound investment as the sales departments have been in enlarging the list of depositors."

Trade associations, the committee believes, should be "compelled to gather the basic information relating to their industries and to make it public."

Also, progressive shortening of the work-week should receive serious consideration of industry and commerce. "It is probable that the distribution of wealth between consumers and investors could be much improved by adopting new working hours and overtime policies."

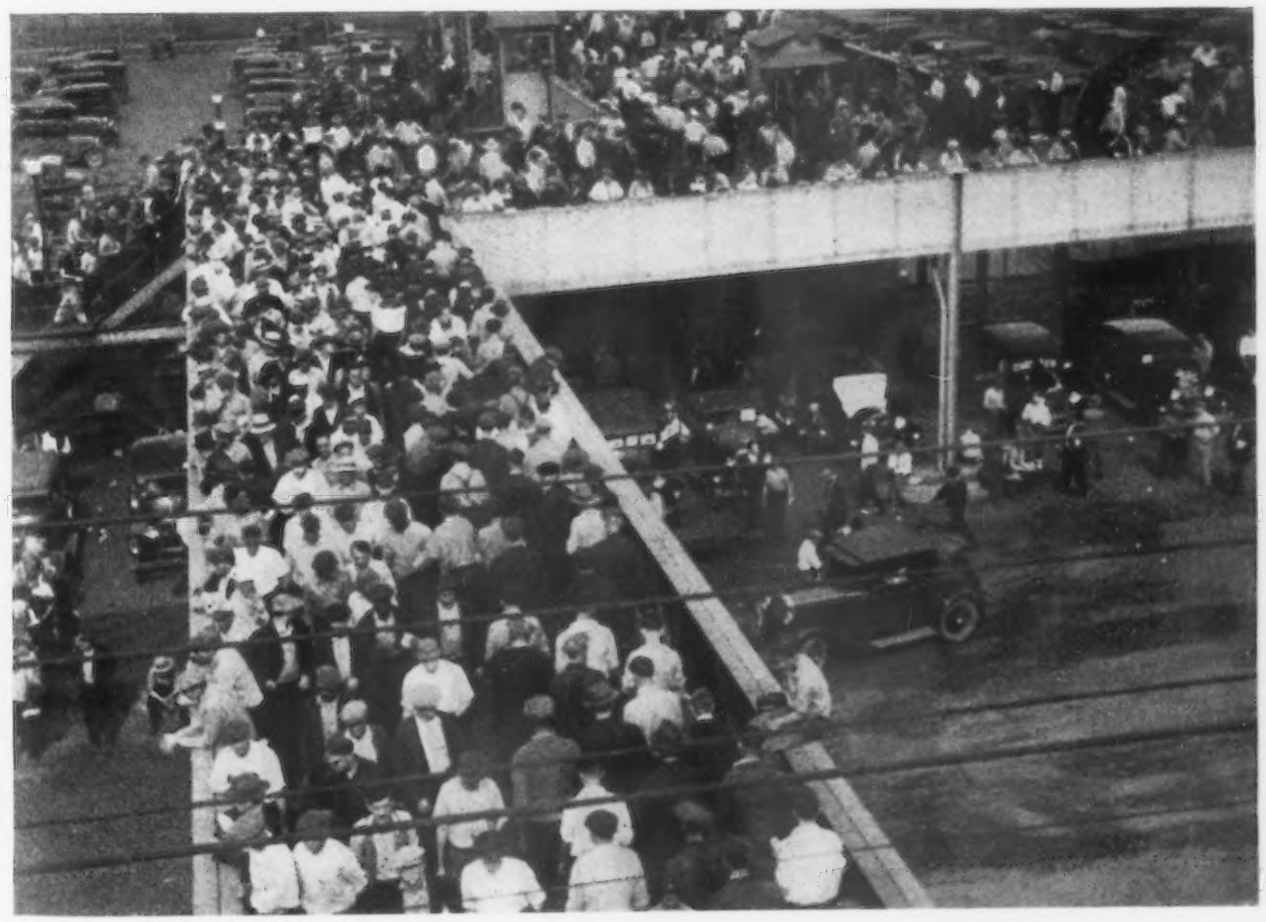
In concluding this necessarily condensed review, the wish may be expressed that enough has been said to arouse the hope that the complexities of modern industrial life will be clarified in the manner outlined. We need clarification to give us the charts for steering our courses. If clarification is too difficult to achieve, we should know it. The sponsors of the investigation, carried on as it promises to be, will be public benefactors of the first rank.

Accelerating Production at River Rouge

HERE are the first pictures showing the resumption of activities at the Rouge plant of the Ford Motor Co., released exclusively to THE IRON AGE. They were taken during the past few days and should encourage those who may have thought that the average man had lost his purchasing power.

It is impossible, in any picture, to show the vast expanse of employees' cars which extend for over a mile along Miller Road, but this photograph, multiplied by perhaps ten, will give an idea of the number that one may see parked during working hours.

Coming off the shift. Almost like the "good old days" is the outpouring of those whose day's work has been completed and the incoming of those whose day's or night's work is to begin. Employment, of course, is not yet up to normal, but production is increasing daily and nearly a million dollars a day has already been added to the purchasing power of Detroit's wage earners through these activities.



STEEL BARRELS MANUFACTURED BY

WITH the development of suitable equipment, including a flash stripping machine, important savings have been made in joining the side seams of steel barrels by means of electric resistance welding. The process and results are outlined in this article.

APPROXIMATELY 6,000,000 steel barrels are manufactured yearly in the United States alone, and if drums, special containers, tanks, etc., are considered, the number will run much higher.

Of this large number the majority is the standard 55-gal. barrel made from No. 18 gage steel and weighing about 51 lb. The barrel consists of two chimes or heads and a body that is made from a sheet measuring 36 x 72 in. and weighing 38 lb. This sheet is rolled into tubular shape and joined at the edges, and the tube thus formed is corrugated to add strength and to facilitate handling the completed barrel.

Methods that have been used to join the side seams of these barrels include riveting of the lap joint, lock seaming, and welding by the automatic arc or other autogenous process. More recently electric resistance welding has been applied, and with the equipment developed in the past 18 months by the Federal Machine & Welder Co., Warren, Ohio, important savings have been made possible in the joining of these side seams. These machines not only operate at very high speed, with resulting lower unit cost, but they produce a weld of very high quality.

For the weld metal the sheet stock itself, instead of filler rod or electrode metal, is utilized. The welding heat is generated by the resistance of the steel to the passage of low-voltage high-amperage alternating current and is uniform over the entire 36 in. length of seam. The unusual uniformity of this electrical heating is due to the fact that current normally follows the path of least resistance; as the resistance increases with the increase of heat, the current always flows across the coolest juncture of the metal until the entire weld area reaches a uniform heat, when the current density becomes uniform. Conduction of heat plays a part in this process and, in all, heating of the metal along the seam is very rapid. Notwithstanding that a safety factor is always considered in order to overcome any irregularity in the edges of the sheets, the heating and welding of these seams is accomplished in from 5 to 7 sec.

Fig. 1 shows the barrel welding cycle graphically, including the acceleration of the feed in flashing and

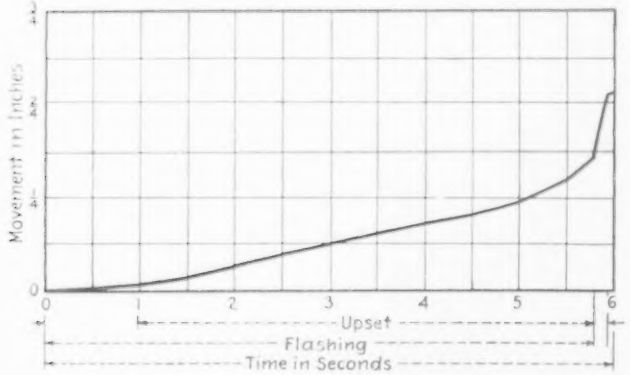


FIG. 1.—Movement of the platen of the barrel resistance welding machine is greatest during the upset. The 36-in. long seam is welded completely in from 5 to 7 sec.

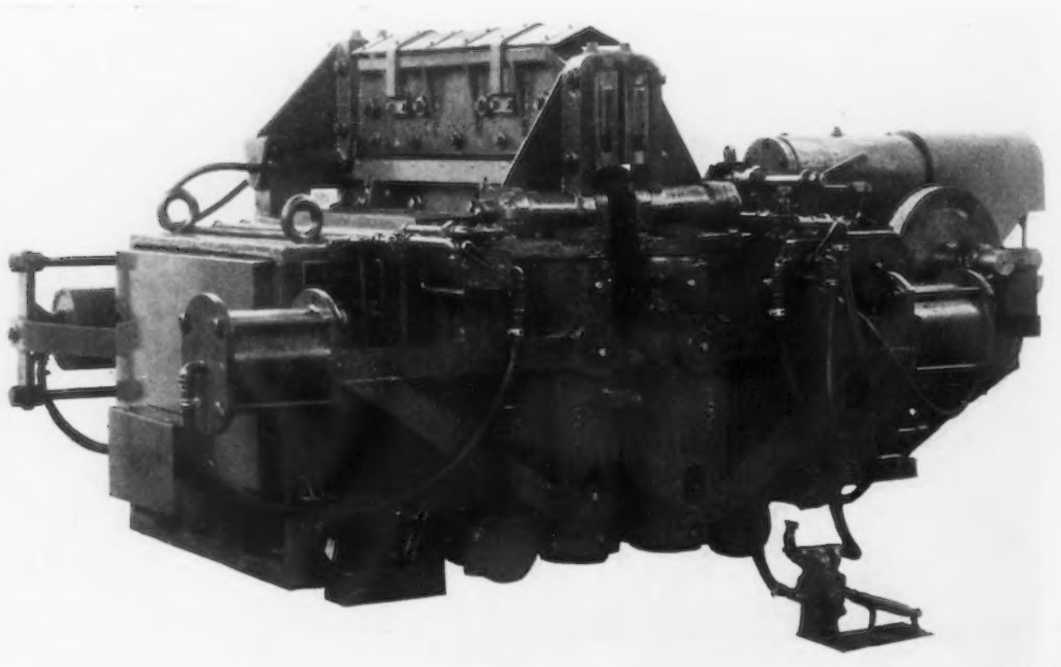


FIG. 2.—In welding the 36-in. long side seams of steel barrels, this electric resistance welding machine produces at the rate of 100 or more barrels an hour. Except for loading and unloading and clamping the steel tubes, operation is entirely automatic.

BY ELECTRIC RESISTANCE WELDING

By M. L. ECKMAN
Research Engineer, Federal Machine & Welder Co.

the upset. Electrical energy is transformed into heat at the point of the weld; having the proper heat, only pressure is needed to make the weld. Electric resistance welding is like the old-fashioned forge welding, except that the heat and pressure are scientifically applied. Because of the closed electrical circuit through the back of the barrel, considerable current travels this path, but this is allowed for in the transformer design.

Barrel Bodies Welded at Rate of 100 an Hour

The machine developed by the Federal company for the welding of steel barrels is shown in Fig. 2. It is a self-contained unit and the principal elements are the transformer for supplying the heating current and the motor-driven cam-actuated mechanism for applying the necessary pressure at the proper time. The machine is built low to facilitate handling the barrel stock in and out of it; this is a feature of importance because upon the handling time depends the speed of production. This welder uses only about 150 kva., or 60 per cent of its current capacity, for 5 or 7 sec.; at the moment of upset it uses its full rated capacity of 250 kva. for about ⅛ sec. Production of 100 barrels an hour is easily accomplished with this machine, and under ideal handling conditions one operator and two helpers have welded and flash stripped barrels at the rate of 140 an hour.

In the usual set-up, the tubular formed sheets that constitute the body of the barrel come to the welding machine upon gravity conveyors. The operator slides the formed tube into the machine on rollers provided for the purpose (see Fig. 3) and then moves the front latches of the upper clamping arms into position. After placing one edge of the sheet against a locating gage, he moves an air valve to clamp it rigidly, and finally places and clamps the opposite edge of the sheet. The gage is removed automatically and with the pressing of a push button the machine is started on its cycle of operations. In 5 or 6 sec. the flashing has been completed and the welding is finished by forcing the edges of the sheet together, which in welding nomenclature

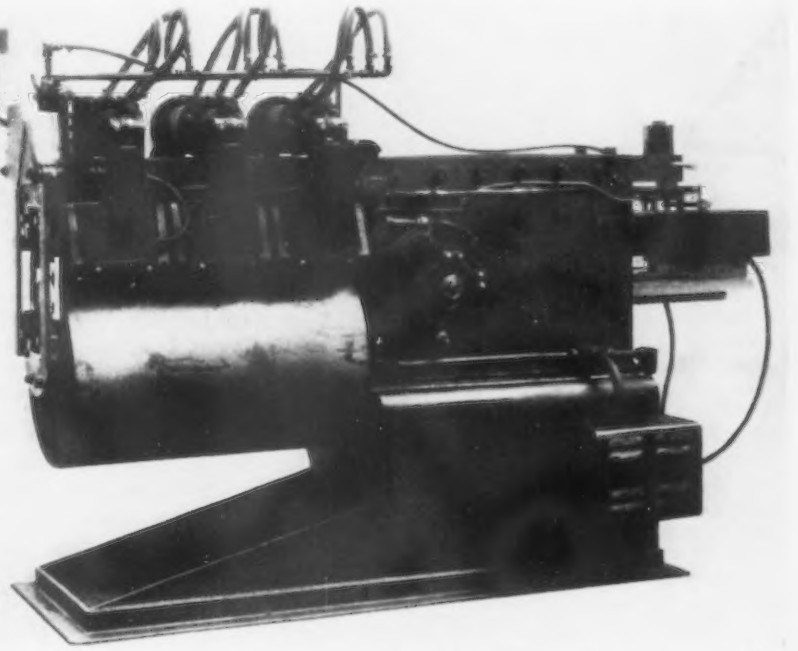


FIG. 4.—Flash stripping machine with a 36-in. steel barrel body in place for stripping. The roughing cut is made on the outward stroke and the finish cut on the return stroke, both the inside and outside flash being stripped at the same time.

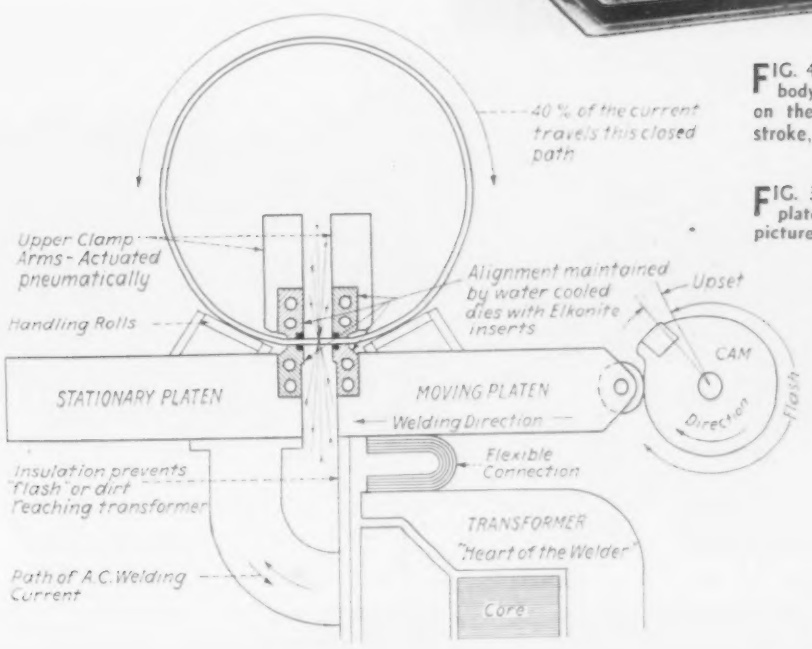


FIG. 3.—The position of the handling rolls, dies, clamps, platens, transformer and other units of the machine pictured in Fig. 2 are shown in this diagrammatic sketch.

is termed upsetting. The welded tube is then unclamped and removed, leaving the machine ready for the next cycle.

The upset throws a ragged fin of metal called the flash, which, for reasons of efficiency and appearance, must be removed. This is done by means of the flash stripping machine shown in Fig. 4. This machine has a reciprocating double ram which carries roughing and finishing tools, the former cutting on the outward stroke of the ram and the latter on the re-

(*Concluded on advertising page* 20)

Accurate Dies Roll T

ALONG row of electric furnaces supplies the metal for casting billets and slabs. ▲▲▲

A LARGE part of the material used in the production of machine and cap screws at the plant of Scovill Manufacturing Co., Waterbury, Conn., is brass and copper which is produced in the company's own nearby mills. Raw materials in the form of electrolytic copper, zinc and scrap are melted down in electric induction furnaces located on the top floor of the casting shop. Some of the furnaces are tapped into specially designed multiple section molds by means of which five or six bars are cast at one time. The different mold sections, clamped together during casting, are quickly opened as soon as the metal solidifies and the bars are then removed and later are rolled into strip. Other furnaces are tapped directly into billet molds to produce standard sized billets weighing about one-half ton each. These go to extrusion machines where they are extruded into rods which later are drawn down to wire for the machine screw department.

The billets before entering the large extrusion machines are sawed to length with cold saws. These saws are of somewhat unusual design in that they reverse the cutting action of the familiar disk saw. The cutting teeth of the billet saws instead of being on the periphery of a circle are on the inner edge of a flat ring, thus presenting a concave arc to the billet instead of a convex as with a disk saw. This gives a greater angle of contact with resultant quicker cutting action. The pieces cut to length are heated in a nearby furnace before being extruded.

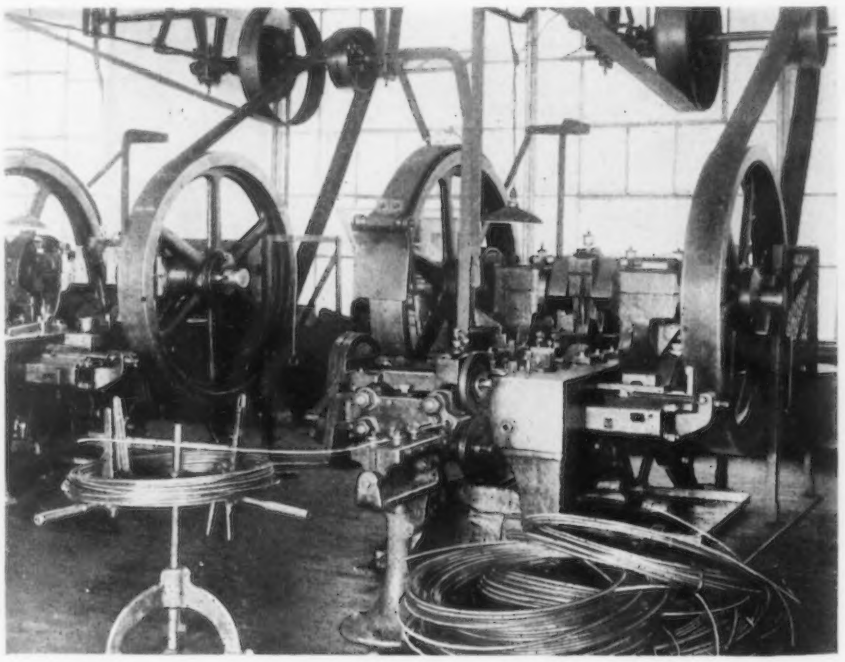
In the process of extrusion, the metal is forced out through dies into a long rod which runs out on rollers on a table. One of the extrusion machines is fitted with an automatic coiling device by means of which the hot rod instead of running out on a table is coiled in a container as it is extruded. In the wire department, the rods are drawn down to the desired diameter in the usual manner with annealing at frequent intervals and close inspection as features. Sections containing defects are cut out and discarded.

Wire in various sizes and kinds as specified, enters the large screw department which occupies an entire four-story building. Here it is stored on the lower floor to become raw material or stock for the production of thousands of varieties of screws.

Making Rolled Thread Screws

In 1920 the Scovill company started the manufacture of what was called a formed head cap screw. These were headed in two blows. The heads were annealed in a lead bath and the round head then squeezed to a hexagon shape by tandem drawing dies. After the heads were thus formed they were shaved both top and bottom and the stems were then pointed when they were ready for the threading. This method produced a strong head structure with hardened facets and an absence of cracks. In 1927, however, a new type of head was adopted by the American Society of Mechanical Engineers and the Society of Automotive Engineers and the manufacturing procedure at the Scovill plant was altered to produce this new type. The new head contains less material, but is better adapted to cold heading and trimming and has satisfactory strength.

The threading at the Scovill plant is all done by holding dies. This method has been in use since some time prior to 1900. At first rolled threads were not particularly accurate. How-



WIRE from coils is fed into automatic heading machines for the first operation in the manufacture of cap screws.

es Required for ed Threads

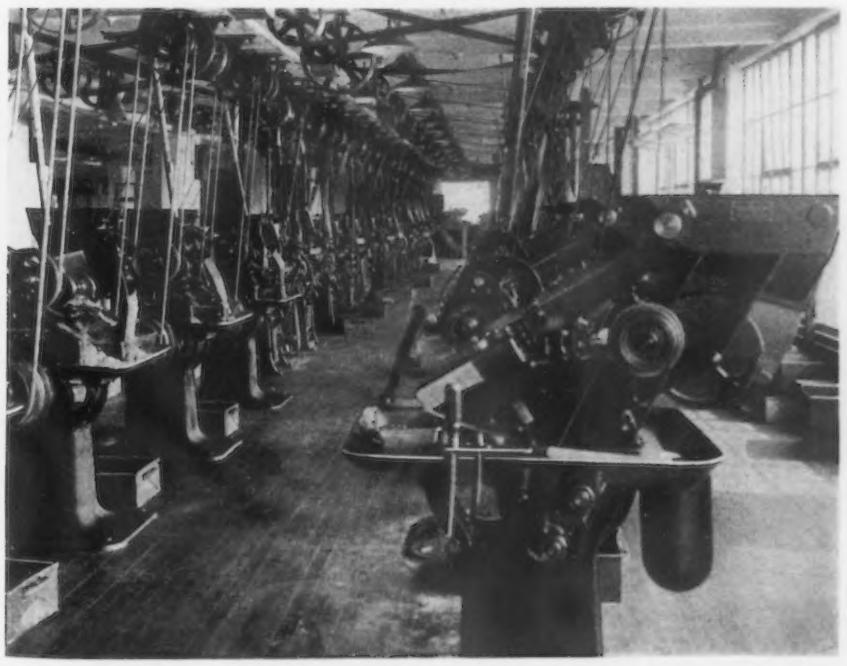
By HERBERT L. SIMONDS

THE Scovill Manufacturing Co., Waterbury, Conn., first started the production of machine screws by the old upsetting, rolled thread method in 1903. One of the first jobs was small brass screws used on shade holders for electric fixtures to hold the shade in position. An outside electrical manufacturer became so interested in this process that he asked the Scovill engineers to experiment on the production of all brass screws used in electrical work. This was done, the screws were satisfactory and with this encouragement a full line of sizes of machine screws was developed. Today the Scovill screw department produces 26,000 different styles and sizes of screws with a total production reaching hundreds of millions of screws yearly.

ever, when Scovill engineers began the manufacture of rolled threads much experimental development work was done to more closely control thread dimensions and the floating die method of rolling was invented and adopted. By this method one of the dies is firmly fixed to the thread rolling machine and the other die is held by flexible means so that it is free to float in relation to the fixed die. With this method it was found possible to produce threads which were more accurate than those produced by any practical method of die cutting.

Within the last few years, in addition to the standard cap and machine screw business in both steel and nonferrous metals, the Scovill company has placed particular emphasis on the development of special screw business and for this special line many new and ingenious machines have been designed and built by the company's engineers. The company now turns out as routine procedure special types of cold headed screws which previously were considered practical only by casting and machining. The present method of making most of the more usual types of screws is something as follows:

Wire from coils is fed into an automatic header machine which cuts off pieces of the desired length and moves each piece, one at a time, in front of the dies where the head is upset by one or more blows. Usually the first blow drives the short piece of wire snugly home into the dies and partially upsets the head; the second blow completes the heading. After this an ejector pin pushes the upset piece out of the die and causes it to drop into a container below.



HOPPER fed automatic slotting machines cut the slots in the heads of round and flat head screws.

Blanks from the header go to clipping machines which trim the head to hexagon shape. Then follow automatic shaving machines which bring the heads to exact dimensions by shaving the top and bottom. Inexpensive screws, such as brass binding posts for dry batteries, go from the headers direct to tumbling barrels and from there to the threading machines. Screw heads are usually slotted with small circular saws which operate automatically in head slotting machines. In one type of machine the screws are fed to a revolving disk which passes beneath the saw. For large headed screws with wide slots two saws are used, the screws passing first to one saw which cuts one-half of the slot and then to another saw which cuts the other half. Sometimes the slotting of a screw is done by the header at the time of upsetting, but this does not give as sharp an edge and is seldom used for screws intended for removal after an original assembly is made.

Dies Must Be Accurate

The success of a rolled thread is determined by the dies. These are carefully designed and constructed. The threads in the dies are cut with milling hobs which have the same tooth contours as those desired for the screws. The process of rolling a thread looks very simple. A blank is fed on to the rigidly held lower die and the upper floating die is quickly moved across the face of the lower die, rolling the blank between the two dies much as a pencil might be rolled

(*Concluded on advertising page* 20)

Carbide Milling Profitable in Both Lo

By FRANK W. CURTIS
Research Engineer, Kearney & Trecker Corpn., Milwaukee

TUNGSTEN-CARBIDE milling has already passed experimental stages, and is used successfully in many plants. Face milling with inserted-blade cutters is perhaps the most common class of tungsten-carbide milling at this time.

Milling is without question one of the most practical applications for tungsten carbide. In a lathe operation, for example, one or two tools usually do all the work, but with a milling operation the metal removal is divided among a much greater number of teeth, so that no great load is ever imposed upon any one cutting edge. In turning, a feed of 1/32 in. per revolution is not uncommon, yet in milling, half this amount per tooth is rarely reached. From this it is evident that a cutting edge with less feed, and therefore less duty to perform, will stand up much longer than one cutting at a heavier feed. This comparison is made merely because tungsten-carbide turning is conceded to be entirely practical, whereas doubt is sometimes expressed as to the practicability of tungsten-carbide milling.

Two distinct gains are to be made by the use of tungsten carbide for milling. One is longer life between grinds; the other is more output. Where the set-up time in changing cutters is great, tungsten carbide can be used profitably at the same feed now possible with other cutting materials because of its long-life advantage. However, increased output combined with longer cutter life between grinds is the most usual gain. Best results are obtained from milling machines basically designed for tungsten-carbide operation, yet there are many existing machines that will perform favorably with tungsten-carbide cutters. Old, dilapidated machines are never to be considered practical.

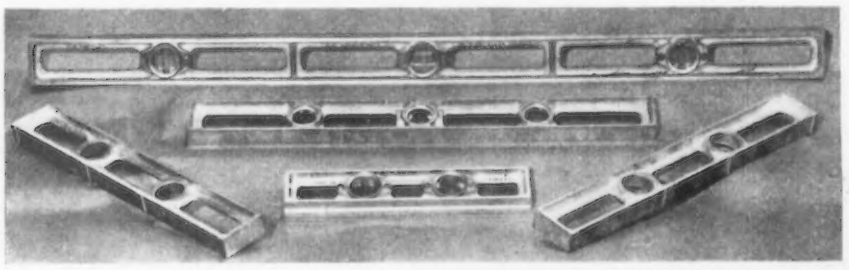
The outstanding foe of tungsten-carbide is vibration; to put it another way, the most essential requirement is rigidity. Three factors contribute to the combined rigidity needed for tungsten-carbide milling—the machine, the fixture and the cutter. One is equally dependent upon the other, so much so that a weakness in one would offset the effectiveness of the other two.

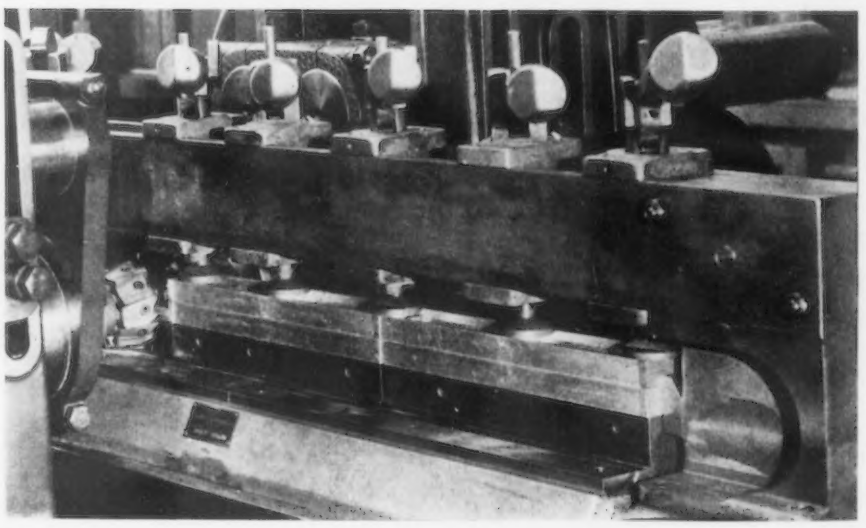
Considering the fixture, the question was once asked what the best rule would be to follow in the design of a fixture, and the reply was: "Make the fixture as strong and husky as your better judgment directs; then add about 50 per cent more strength as a margin of safety." This is about all that can be said. Clamps should be unusually strong, the locating points should be of a positive nature, and the work should be given as much support as possible. There is a decided advantage in making a fixture such that the work can be located and clamped quickly.

The same rule of rigidity applies to cutters. Above all, the cutting edges should receive adequate support, and if the cutter is of the inserted blade type, the blades should be positively locked in the body so that there is no chance of having them push away from the cut or becoming loose in the body.

Tool Cost Per Piece Should Not Be Determining Factor

Tool cost per piece of any product should not be the determining factor as to whether tungsten-carbide mill-





THE tungsten-carbide milling of these aluminum spirit levels furnishes an example of savings due to the elimination of subsequent operations. Formerly these castings were disk ground, and the surfaces were somewhat scratched. Inasmuch as these surfaces had to be unusually smooth, it was necessary to add two rough polishing operations and a finish stoning operation.

Finishing these levels by tungsten-carbide milling has eliminated the two polishing operations; likewise the heat usually caused by polishing has been eliminated so that the surfaces do not warp as they did formerly, and this, in turn, has eliminated a straightening operation. The present milling feed is 100 in. per min. The milled surface is unusually smooth, so that only a very slight stoning operation is necessary to produce an unusual polished-like surface.

▼ ▼ ▼

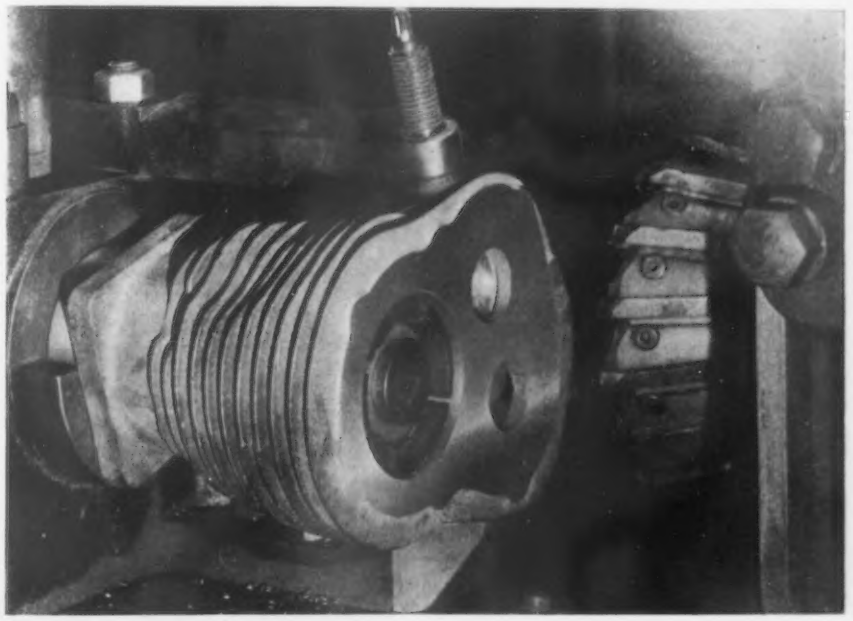
...th Long and Short-Run Work

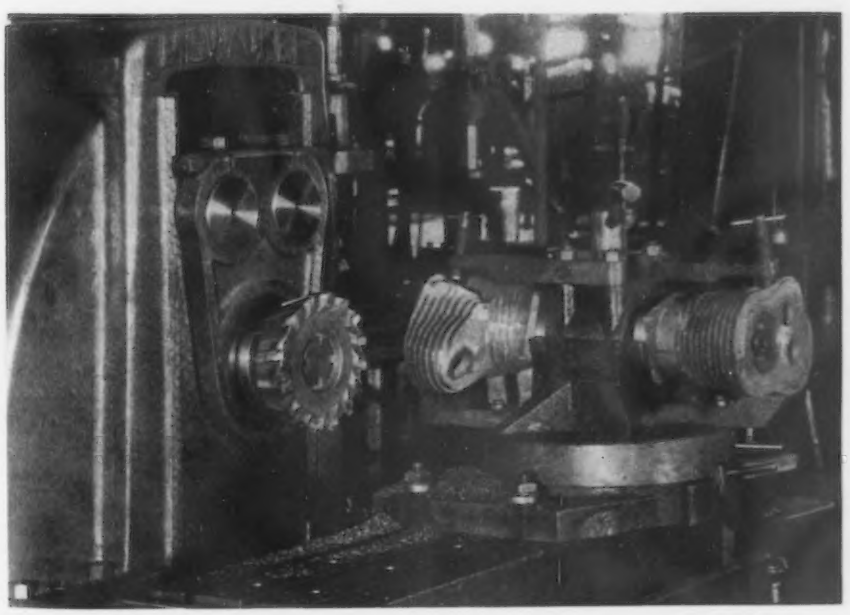
INCREASED output combined with longer cutter life between grinds is the most usual gain from cemented-carbide milling. But there are others—as shown by Mr. Curtis in this abstract of his paper presented at a recent meeting of the metropolitan and Plainfield, N. J., sections of the American Society of Mechanical Engineers. Other data contained in Mr. Curtis' interesting paper were included in the report of the meeting in THE IRON AGE of March 24, page 746.

ing should be used. There are cases where an expensive cutter could be used for two weeks at a considerable increase in tool cost per piece, but other savings resulting in the two-week period of operation have more than paid for that particular cutter.

Here is an actual example: An operator being paid $5.60 per 10-hr. day was able to double his output by using a 4-in. tungsten-carbide cutter. The job was facing a small casting which formerly paid him $1.04 per 100, but which now pays him 51c. per 100 because of the increased feed and speed. That means two days' work in one, or a direct labor saving of $5.60 per day. The management estimated the burden at $1 an hour. This is rather conservative, but anyhow an extra day's work would be equal to $10. That means a total daily saving of $15.60. The cutter at $125 would pay for itself in about eight days—a large return for so small an investment. Suppose only a 25 per cent increase had been made. This would be equal to $3.60 a day; the cutter would pay for itself every 35 days. Based on a 300-day year the investment would yield more than 850 per cent.

In another shop a tungsten-carbide cutter was applied on an existing machine for milling pump bodies. The feed used was 8⅝ in. per min. The pump bodies were spotted after scraping, and the resulting surface was excellent. It was possible to eliminate the scraping operation formerly required because the pieces are now milled with exacting smoothness. The amazing part of the operation was that the pump bodies are machined in one pass, instead of the usual rough-

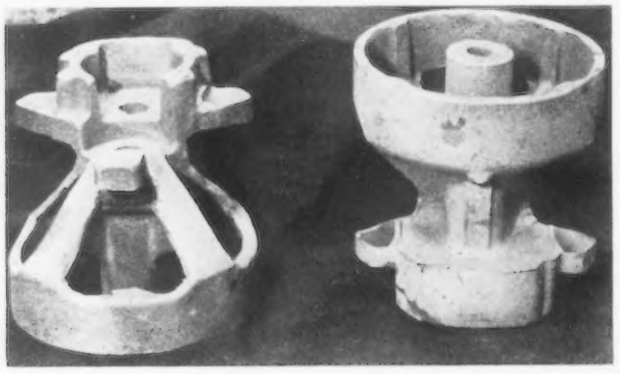




MILLING a cast-iron motorcycle cylinder in a Milwaukee Simplex milling machine fitted with a 7-in. full-back tungsten-carbide cutter. The index type fixture permits loading one piece while another is being milled. Approximately 3/32 in. of material is removed at a speed of 305 ft. per min. The table feed is 26 in. per min. The life of the cutter is approximately 1500 pieces per grind, although at times this has been exceeded. Formerly the operation was done in a lathe with a single-point tool, the operator running two machines. A 20 per cent increase in hourly production is now obtained from the one tungsten-carbide milling machine.

ing and finishing cuts, in approximately 2 min. for both sides, as against 18 min. for both sides as formerly machined.

In milling the carburetor face of cast-iron manifolds with a 4-in. tungsten-carbide cutter at a large automotive plant in Detroit, the feed was increased from 13 in. a minute to 26 in. a minute, and the cutter was operated at 300 ft. per min. A beautiful finish was obtained, something that had never been done before, and 900 pieces were milled between grinds as compared with approximately 200 pieces formerly.



MILLING the top and bottom faces of three pads of a cast-iron frame unit. A Milwaukee Simplex Miller with a three-spindle head is used; two 5-in. cutters are mounted in each spindle, which, in turn, operate at 260 ft. per min. The table feed is 21 in. per min. and a piece is completed in 21 sec. The work was previously done on a single-spindle machine and an indexing fixture.

Subsequent Operations Eliminated

A case where scraping was eliminated because of the smooth finish obtained from tungsten-carbide milling has been mentioned. There are many savings of this nature which are independent of the actual savings from the machine itself.

In one tungsten-carbide milling operation, which was formerly disk ground—that of milling intake manifold faces—two very careful washing operations have been eliminated. With the grinding, abrasive dust lodged in the intake ports and extra precaution had to be taken to remove it, and even after two washing operations, there were cases where the abrasive dust would get into the cylinder after the manifold had been in use. Tungsten-carbide not only eliminated this difficulty, but also produced a better finish.

Another case of this kind is the milling of aluminum spirit levels shown in the accompanying illustrations.

In our own work it has been found that a tungsten-carbide milled surface is much smoother than that milled with other cutters. On ways and flat surfaces that must be scraped, the scraping time has been reduced by almost half. This is because tungsten-carbide milling is done at high speed and that less heat is generated in the work. Then, again, a tungsten-carbide cutter produces a clean smooth finish, whereas high-speed steel has a tendency to "compress" the surfaces of the metal being machined so that scraping is more difficult.

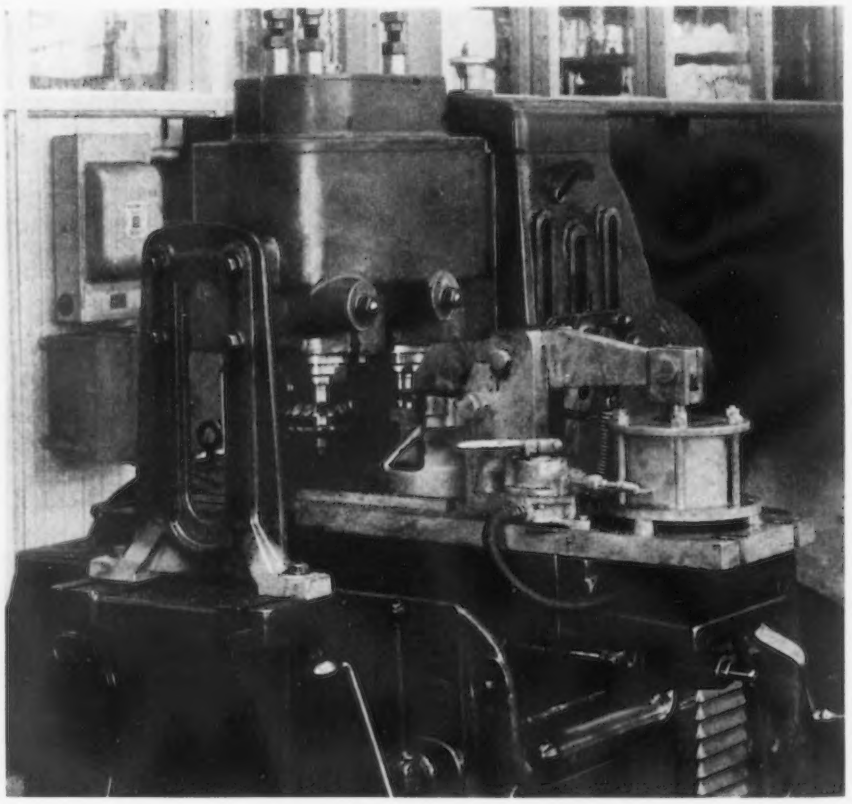
There are numerous tungsten-carbide milling operations which have enabled roughing and finishing cuts to be combined into one. In many cases it has been possible to attain a better finish in the one cut than heretofore in two cuts with other cutters.

In addition to the advantages mentioned, there are others. One outstanding gain is the fact that less material can be allowed for machining a given surface. Tungsten-carbide milling is not affected seriously by scale, and where allowances from ⅛ to 3/16 in. in depth have been made, these can now be halved, or reduced to 1/16 to 3/16 in. When such a change is possible there is a decided gain in production because the increased feeds can be used without straining or overloading the machine. Another gain, of course, is the fact that less power per square foot of surface machined is made possible.

On some work chipping or breaking away of edges is a serious objection, and with the average cutter it is necessary to reduce feeds proportionately to avoid such a condition. With a tungsten-carbide milling cutter operated at a higher speed, it is very rare that the edges of a casting are chipped or broken away.

Profit in Carbide Milling a Single Piece

The question has been frequently asked as to the quantity of work which would make tungsten-carbide milling profitable. For our own work we use a tungsten-carbide cutter if we have only one piece to machine, and we find this profitable from many standpoints. In the first place, the operator knows he can turn out a better job and produce a much better finish with a tungsten-carbide cutter. Then, we often reduce the time of subsequent operations, which amounts to a substantial saving. It is just as easy for an operator to get a tungsten-carbide cutter from the crib as it is to get any other cutter. There is no difference in the set-up time, but there is a gain if the work can be done more accurately and if the finish will be better.



Naturally the most outstanding gain from tungsten-carbide milling will be made in high-production jobs, but it must be remembered that even where the runs are small there will be a gain that makes tungsten-carbide milling profitable. Tungsten carbide is not a cure-all by any means, but where this material can be used it should be applied without hesitation.

The development of tantalum car-

bide for machining steel has been very rapid and today it is quite possible to mill a great many steel parts with amazing speeds and feeds comparable to tungsten carbide.

From experiments conducted to date, it seems that tantalum carbide does not have the same high strength as tungsten carbide, and for this reason the greatest limitation is the depth of cut. Undoubtedly this will be overcome in the near future, because the strength and resistance to wear of tantalum carbide is being increased very rapidly.

In milling, for example, it seems that the maximum depth of cut for face-milling cutters fitted with tantalum-carbide blades is, at this time, approximately ⅛ in. If the depth of cut exceeds this amount, and if the cutter itself is operated at speeds and feeds that would ordinarily be expected then there is likely to be difficulty. On light cuts, up to 3/32 in. depth, the results are amazing. In recent tests, S.A.E. 1020 steel was milled at speeds up to 300 ft. per min., with table feeds exceeding 40 in. per min., and depth of cut varying from 1/12 to 3/32 in. These cuts are far greater than would ordinarily be recommended; they are mentioned here merely to show the possibilities of tantalum carbide for milling steel. Generally speaking, what has been said about tungsten carbide applies equally to the use of tantalum carbide.

Wear in Service Testing of Car Parts

Taking as his subject, "Relation of Service Testing to Metallurgy of Automobile Parts," J. L. McCloud, metallurgist, Ford Motor Co., in a paper before a recent joint district meeting of three local Detroit sections of large technical societies, said that, when a design is completed and at times while it is still in the formative stage, it becomes a paramount problem to answer the question—How will it wear?

From a metallurgical point of view there are two ways "wear" occurs. The first one is the more common one of how the parts will resist the abrasive action encountered in service. The other—will the structure wear in the sense of having sufficient strength in all of its component parts and, as a whole, withstand the stress imposed upon it by the service it is called upon to perform? It is this latter type of wear that we test for by a service test, when a design is complicated and the stress imposed in service is difficult to analyze. Such service tests are often short cuts as a means to knowledge that the parts are adequate.

Many Automobiles Now Have Tin Plated Cast Iron Pistons

WITHIN the last year or so a new use for tin has been developed in the automobile industry. The application is both novel and interesting.

About a year ago the General Motors Corpn. made some experiments in the coating of cast iron pistons with tin. These were so promising that the idea was further developed. It is authoritatively stated that a large majority of the cast iron pistons used by General Motors in all its car models are now given a coating of tin and that one or two other automobile producers have also adopted the practice.

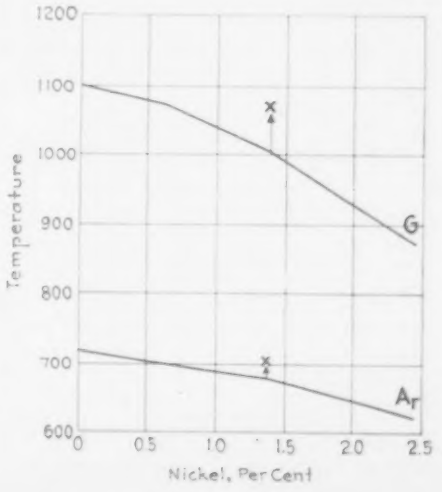
The idea back of this development is a reduction in the coefficient of friction between the piston and the wall of the cylinder, especially in new engines. The tin plate produces a better running surface. The amount of tin is very small, the general practice, as thus far developed, being to limit the thickness of the tin plate to not more than 0.001 in. Usually the coat is about 0.0005 in. The pistons are placed in an electrolytic plating bath in which the tin coating is applied according to standard electroplating methods. The cost is claimed to be small and more than justified by the results.

One of the major annoyances of the purchaser of a new automobile is the fact that, for the first 1000 miles or so, the speed must be kept down to a moderate pace so as not to harm the engine. It is pointed out that the tin plating of cast iron pistons largely eliminates this drawback—it is not necessary with such pistons to "run in" the engine so long and a new car can be run faster from the start. While some of the tin plate is worn off at points of high pressure after the first 1000 miles, the benefit of the coating of tin still remaining is decidedly noticeable.

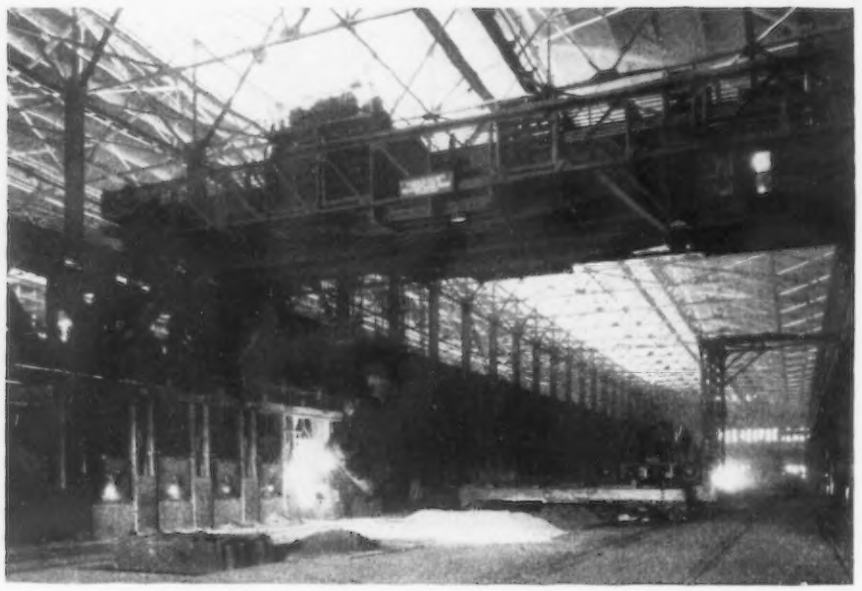
The automobile industry is rated as the second largest consumer of tin. Should the practice of tin plating cast iron pistons increase, it will mean, of course, a still larger consumption of tin by this industry, easily made possible at the present low market prices of the metal.

Effect of Nickel on Graphitization of Cast Iron

DILATOMETRIC studies of the influence of nickel on the graphitization of white cast iron containing 2.7 to 3.0 per cent carbon, 0.04 to 0.10 per cent graphitic carbon, 0.4 per cent silicon, 0.12 to 0.19 per cent manganese, 0.02 to 0.08 per cent sulphur, and 0.07 to 0.09 per cent phosphorus, have been reported by L. Thiery (*Revue de Metallurgie*, January, 1931). In the absence of nickel, graphitization of this iron was slow, owing to the free sulphur and low silicon content. As shown by curve G, additions of nickel up to 2.46 per cent decrease the graphitization temperature progressively from 1100 to 875 C.; according to curve A_r, the same concentration of nickel lowers the transformation temperature from solid solution to pearlite about 80 deg. The points indicated by small crosses show the influence of 0.34 per cent chromium on the 1.37 per cent nickel alloy in raising both the graphitization point and the transition temperature. This addition of chromium produced an exceedingly fine structure.



Capacity of 800,000 Tons of Ingots Annually Added to Gary Open-Hearth Plant



Hot metal is charged into furnace from 100-ton hot metal ladle suspended from 150-ton overhead crane.

At the Gary, Ind., Works of the Illinois Steel Co., seven new open-hearth furnaces have been built at the end of a group of four existing open-hearth units. The new units are of the stationary type, each of 150 tons capacity. There is provision in the present building for installing one additional furnace, and the plant is designed for a future extension to a 14-furnace plant.

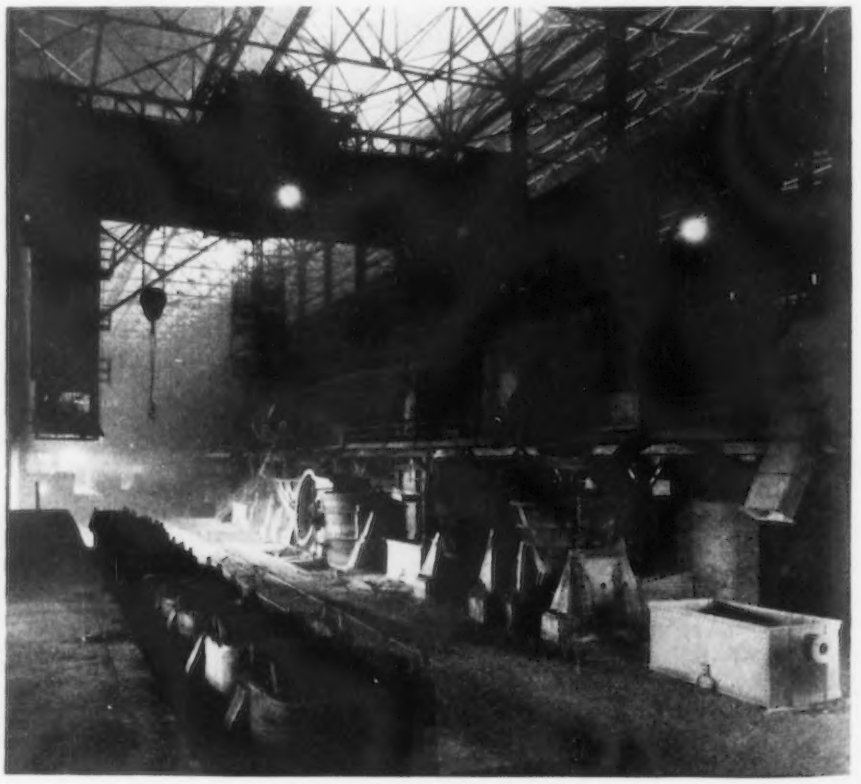
The charging floor is placed at the high level of 20 ft. 6 in. above the yard level, thereby avoiding the necessity of pits for steel ladles and providing ample height for regenerative chambers and space for installation of air preheaters at a later date if found advantageous.

Full equipment of auxiliaries includes one 600-ton hot metal mixer with provision for the installation of a second mixer, modern equipment for the operation of furnace doors, port cooling devices, etc. A waste heat boiler of the horizontal fire tube type is installed at each furnace. Ingot stripping requirements are provided by a 60-ft. extension to each of two existing stripper buildings. Refractory material is handled through the present refractory plant by added equipment.

The seven 150-ton open-hearth furnaces have 16 x 48 ft. hearths, which measure 19 x 78 ft. outside of brickwork and are spaced 96 ft., center to center. The furnaces are of the pan bottom type, that is, the brickwork of the furnace bottom is supported on structural steel beams and columns instead of on solid masonry. This form of construction provides air cooling, thus to make breakouts of molten metal less likely than when the furnace bottom is directly supported on concrete foundations.

The main building of the plant is 154.5 x 816 ft.; 83 ft. of the width comprises the charging side of the building and 71 ft. 6 in. the pouring side. The charging side of the building is served by two traveling cranes of 74 ft. 6 in. span, each having 150-ton main hoist and 40-ton auxiliary. Hot metal from the mixer is conveyed to the furnaces in 100-ton capacity ladles mounted on cars running the full length of the building. In charging a furnace the ladle is lifted off the car and carried across the charging floor by the 150-ton overhead crane, the hot metal being charged into the furnace through a suitable runner. Raw materials are charged into the furnaces by two 12-ton charging machines.

On the pouring side of the building are two traveling cranes of 65 ft. 2 in. span, each having a 200-ton main hoist and a 40-ton auxiliary.



Pit side of open-hearth plant showing 150-ton steel ladles and cinder ladles in position. The crane is of 200 tons capacity.

Steel is tapped into ladles of 150-ton capacity. Along the side of the building are arranged three pouring platforms and tracks for pouring the steel into ingot molds. A 6-ton jib crane for handling the tapping spouts is installed at each furnace.

A lean-to, 60 x 816 ft., contains tracks for raw materials, also the furnace flues, stacks and reversing valves. Seven 600-hp. waste-heat boilers of the horizontal fire-tube type are installed in this lean-to, each boiler having 7820 sq. ft. of heating surface and equipped with superheater of 450 sq. ft. heating surface. Steam is generated at 275 lb. per sq. in.

The mixer structure consists of a main building 86 ft. 6 in. wide, and a lean-to, 71 ft. 6 in. wide, with a common length of 150 ft. The main building contains one 600-ton mixer and is served by a traveling crane of 79 ft. 6 in. span, having 125-ton main hoist and 40-ton auxiliary. The lean-to, which contains lining pits and drying stands, is served by one of the pouring cranes (200-ton main hoist and 40-ton auxiliary), the runway of which extends north into the mixer building.

The gas producer building, 22 x 686 ft., contains fourteen 10-ft. diameter mechanical gas producers, two to each furnace. Each producer will gasify 5000 lb. of gas coal per hour.

The mold yard, 100 x 336 ft., is commanded by a traveling crane of 94 ft. 6 in. span, having a 25-ton hoist.

The stock yard, 70¼ x 1344 ft., is served by two cranes of 70 ft. 3 in. span equipped with 10-ton hoists.

The skull cracker, 76½ x 240 ft., makes use of two cranes of 73 ft. 10 in. span, each being a combination bucket and magnet handling crane of 40 tons capacity.

The refractory plant extension, comprising three dolomite cupolas and corresponding grinding capacity, is equipped with a crane of 43 ft. span having a 10-ton hoist.

Normal capacity of the seven furnace plant is estimated at 800,000 tons of ingots per annum, for which pig iron requirements will be available from existing blast furnaces at Gary Works.

Steel and cinder ladles in position at an open-hearth furnace.

Scrap is loaded into charging boxes by a magnet hung from a 10-ton crane.

The ingot mold yard is served by a 25-ton crane. The skull cracker is shown in the background.

Ores Reduced to Steels in H

By T. HOLLAND NELSON
Consulting Metallurgist
Philadelphia

THE hollow electrode furnace to the average person is merely another type of electric furnace, but to the intelligent steel manufacturer and metallurgist, capable of dissecting this process and analyzing it carefully, with due regard to the various stages and the various possibilities involved, it becomes apparent that it is possible to accomplish in this furnace many things embodying all the experience of past art as well as introducing many entirely new features. The far-reaching possibilities and actual results obtainable will probably not be completely understood for some considerable time to come.

Value of Intimate Contact Stressed

In this article I wish to stress particularly the value of intimate contact—that is to say, the importance of having materials in finely divided form reacting and melting in such intimate contact that something approaching ideal conditions are obtained, which are reflected in high recoveries and more complete chemical reaction than is otherwise possible.

In passing on to a description of what is known as the hollow electrode furnace, the author hopes that he will be able to make clear many of the advantages of this particular process. Fig. 1 gives a cross-section diagram of the furnace. It will be seen that in some respects it resembles the old-type Rennerfelt furnace except for the vertical electrode. For the sake of comparison glance at the diagram of the Rennerfelt furnace reproduced in Fig. 2.

A more careful inspection of the Wiles hollow electrode furnace shows that in place of two solid side electrodes and one vertical electrode, there are two hollow side electrodes placed in a substantially horizontal position. In the ordinary electric furnace practice the arc produced is the source of heat, which by radiation is capable of melting either a cold charge or of being used for the refining by the duplex process of a liquid charge. The electric furnaces with which we are dealing today are usually of the arc type or the induction type and in both cases heat by radiation is really the basic principle of the method of melting.

The hollow electrode furnace, however, behaves quite differently and, although it is true that the heat produced from the arc is available for exactly the same purpose, there are much wider possibilities and the process as actually operated uses the arc and the actual heat of the arc itself to produce distinctly unique features and results.

It is not necessary to explain that when using opposed electrodes and producing a definite arc, the electrode itself becomes substantially heated and, although carbonaceous in character and a somewhat poor conductor, the electrode nevertheless becomes heated over a considerable portion of its length on a gradually declining heat gradient away from the arc. Therefore we have in the hollow electrode furnace an arc which in itself is capable of heating what we will term a furnace in the ordinary way and which at the same time will heat a hollow electrode on a gradual gradient as outlined above.

While illustrations and references up to this point have dealt only with single phase, this has been used merely for the purpose of simple illustration. Furnaces will, in all probability, embrace six or more electrodes, multiple phase. The adaptability of the furnace itself and the flexibility of operation is one of its outstanding features.

Hollow Electrode a Carbonaceous Retort

From this point on I would suggest that the reader cease to consider only an electrode, but visualize the fact that this hollow electrode automatically becomes a carbonaceous retort, or what one may consider a chemical reaction chamber. To make this process perhaps a little more clear, let us refer to Fig. 3, which represents an enlarged view of one electrode.

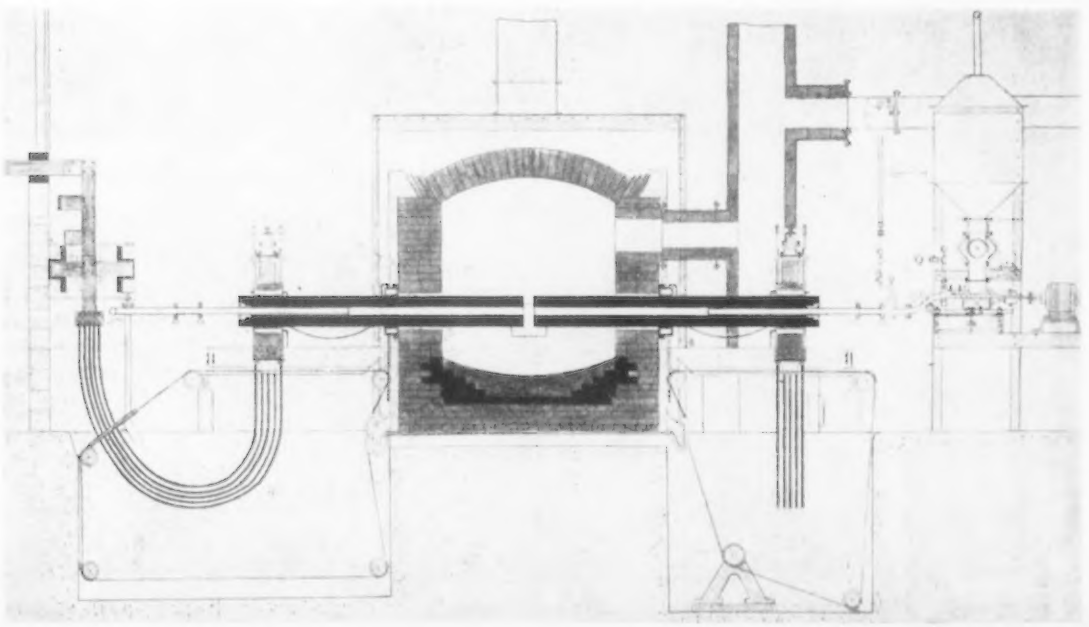


FIG. 1.—Cross-section diagram of the Wiles hollow-electrode ore-reducing furnace.

Hollow-Electrode Furnace

PASSING finely divided ores intimately mixed with reducing materials through hollow electrodes is the principle of the operation of the Wiles hollow-electrode furnace, invented by Sydney T. Wiles, metallurgical engineer, Buffalo, N. Y., and described in this article. High-grade plain-carbon and alloy steels are produced by the chemical reactions in the electrodes, according to the author, who is metallurgical consultant on the process. Particular attention is called to the unusual character of the metal produced and to the effect of the intimate contact of the raw materials during the reduction at high temperatures. The patents and the furnace are owned and controlled by the Buffalo Electric Furnace Corpn., Buffalo, N. Y.

Let us realize that if we regard the electrode as a retort in which varying degrees of heat are available—one end being cold and the other end having available the heat of the arc itself—then it is not difficult to realize that the chemist and steel maker in cooperation may be capable of producing many things that have previously been considered extremely difficult or impractical by any other known type of furnace.

It is probably not claiming too much to say that, for a complete understanding of this furnace, it can be regarded as a single unit which is capable of taking the metalliferous ore from the earth and producing a definitely refined and finished product; or in other words embodying in one furnace the practice and art of the blast furnace combined with the melting, refining and alloying of even the highest type electric furnace.

In the first place, assuming it were possible to move oxide of iron at a controlled rate of feed through this retort, where there is a substantial amount of carbon by contact available on the side walls of the retort itself, in a reducing atmosphere, one can readily imagine that within this chamber the oxide of iron can be readily reduced to metallic iron with the release of oxygen in the form of CO or CO_2. Such a procedure, carried out as outlined, would probably cause considerable erosion within the wall of the retort or electrode. Therefore, let us proceed one step further and imagine that, instead of withdrawing all the reducing agent or carbon from the walls of the retort-electrode, it would be quite feasible to add at least a substantial proportion of the reducing agent required in the form of carbonaceous material, such as graphite, coke dust, etc., which would be much easier on the retort itself and still attain the desired objective. When we have accomplished this and grasp its possibilities, is it not a fact that in a measure we have simply taken a blast furnace in miniature and put it upon its side?

Thus our miniature blast furnace becomes a carbonaceous retort of, say, from 6 in. in diameter up, capable of being used as an electrode, and in place of mass additions of lump ore, coke and limestone, we are able to use intimately mixed particles of materials for chemical reaction and ultimate melting. Regarding, therefore, this electrode as a chemical reaction chamber, or miniature blast furnace, it is easy to see how, in dealing with the principle of reduction in miniature, it is possible to control the chemical reactions so much more completely and efficiently than when dealing with larger masses. The net result is more perfect reactions, higher recovery and, possibly, due to higher available temperatures, new fields for metallurgical research.

Immediately many questions arise as to the behavior of the gangue, etc.; how these materials can be carried through this retort, how they can be controlled and what their reactions are. To give the necessary details of this would be beyond the scope of any one article. It may be sufficient to say, however, that, with the knowledge available today, in the hollow electrode furnace iron ore can be readily

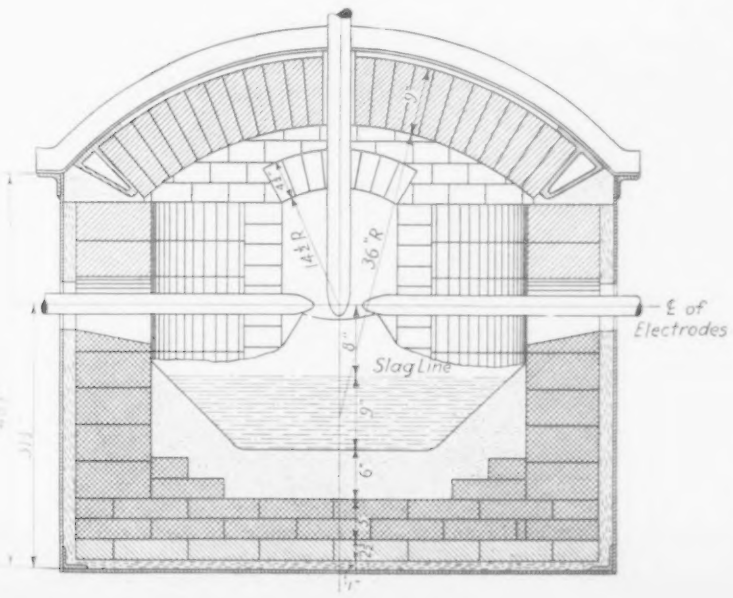
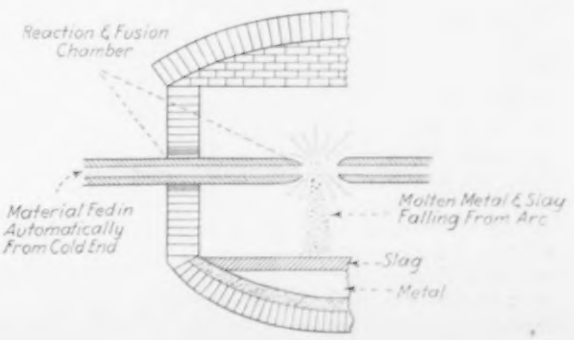


FIG. 2.—(At Left) Front elevation of standard Rennerfelt electric furnace.

FIG. 3.—(Below) Enlarged cross-section of one of the hollow electrodes and half of the chamber of the Wiles furnace.



introduced into the electrode-retort in such a manner and by such careful chemical calculation as to thrust into the arc material of almost any desired chemical composition.

Some of the Heats Produced

Analyses of a few heats of material as typical of what can be attained, using only iron ore and chromium ore with carbon substantially as the reducing agent, are as follows:

Low-Carbon Chromium Steels (Rustless Type):

	Per Cent			
Carbon	0.064	0.047	0.072	0.084
Silicon	0.08	0.03	0.23	0.12
Manganese	0.10	0.04	0.11	0.10
Sulphur	0.020	0.017	0.013	0.023
Phosphorus	0.021	0.016	0.021	0.026
Chrome	12.14	12.40	15.04	19.46

Medium-Carbon High-Chromium Steels:

	Per Cent			
Carbon	0.503	0.704	0.376	0.512
Silicon	0.02	0.13	0.17	0.14
Manganese	0.07	0.03	0.12	0.09
Sulphur	0.024	0.022	0.032	0.028
Phosphorus	0.029	0.029	0.014	0.023
Chrome	12.36	15.40	17.61	16.30

Low-Carbon Chrome-Nickel Steels (Rustless Type):

	Per Cent	
Carbon	0.068	0.072
Silicon	0.12	0.14
Manganese	0.10	0.09
Sulphur	0.028	0.031
Phosphorus	0.036	0.029
Chrome	17.96	18.21
Nickel	8.21	8.38

Characteristics of the Steel Produced

Another item of considerable interest with regard to these heats was that, when the material was finally ready for tapping, it was found on taking spoon tests that there was absolutely no necessity to use deoxidizers to kill the metal. The material sank in the test box perfectly and the ingots on pouring settled down nicely in the mold without any tendency to rise, on the contrary sinking in the hot top like a thoroughly deoxidized or killed high-carbon steel.

Further, metals or their oxides in the form of fines, which have hitherto been an obsession to the manufacturer and have necessitated sintering or briquetting to make them of any commercial value, are in an ideal form for use in this particular type of furnace.

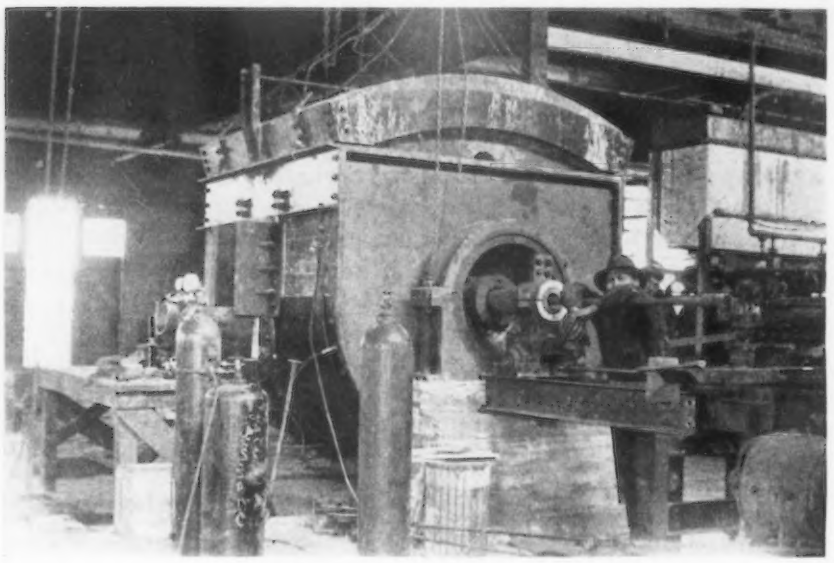


Fig. 4.—Tilting type of Wiles hollow-electrode furnace.

One of the most vital points that is not understood by those who have not had the opportunity of watching or operating this furnace is the fact that the material prepared properly for introduction into the hollow electrode furnace is so intimately mixed that the highest possible chemical reaction can be obtained and so, where exothermic reactions are involved, the maximum values are obtainable, or, where endothermic reactions are involved, there is minimum loss. Moreover these finely distributed and intimately mixed particles, either completely or substantially reduced, finally enter the area of the arc and are melted and raised to temperatures inconceivable to the manufacturer by ordinary processes.

In other words, one must visualize very minute particles of raw materials so designed as to produce definite chemical reactions ultimately passing into the area of the arc and attaining a temperature so high as to be entirely new and, in this still extremely fine diversified condition, being melted and falling down into what we would ordinarily call the bath of the furnace. This bath is maintained at temperature by the same arc and, in addition, by combustible gases when the products of the chemical reactions are productive of such gases.

If we thought of this furnace in no other manner than of reducing iron ore to any type of product from cast iron to mild steel practically carbon free, it would then be an extremely interesting proposition; but when one begins to realize the possibilities of reducing almost any metalliferous oxide under ideal conditions such as a hollow electrode furnace offers, plus the extremely high temperatures available to these minute particles, all of which factors result directly in the highest efficiency for chemical reaction, the ultimate possibilities and adaptations of such a furnace are extremely wide.

The writer has had the opportunity of watching this furnace and actually operating it for a number of heats and has seen some striking results. As an instance, mild steel with carbon content almost negligible was produced from iron ore using carbon as a reducing agent:

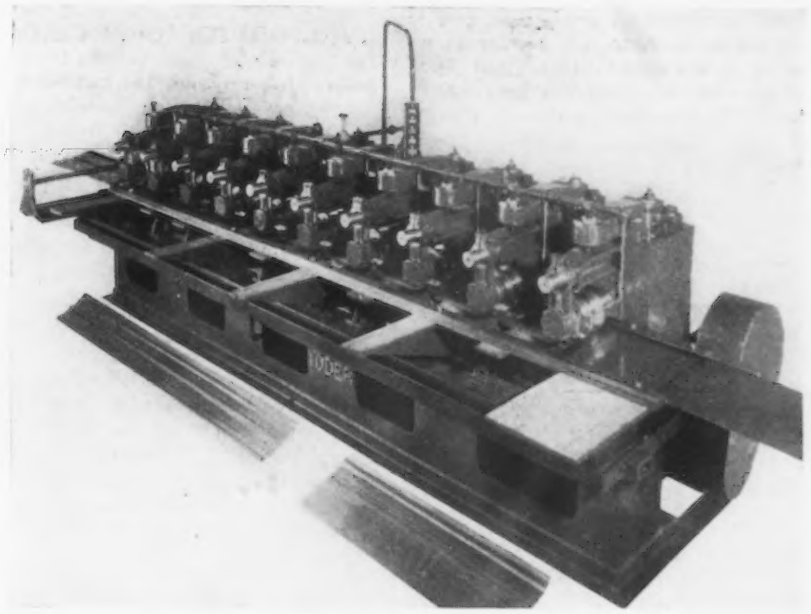
	Per Cent
Carbon	0.036
Silicon	0.11
Manganese	0.23
Sulphur	0.025
Phosphorus	0.019

Full value of this will be appreciated by those skilled in the art and, while carbon is referred to as the reducing agent, there is no reason why other reducing agents cannot be used. Stainless or rustless steels with carbons down as low as 0.025 per cent and with chromium from 12 to 18 per cent using chrome ore with carbon as a reducing agent, and alloy steels of various types, all from their metalliferous oxides, have been produced.

When the full import of these statements is appreciated I think many would agree with me that, if the further development of this process shows the economics of the situation to be what experimental work foreshadows, within a short time we shall consider the development of this type of process as revolutionary in character as any of those which have gone before.

I believe, therefore, that there is no process in the steel industry which is capable of handling material in such a finely divided state, actually melting in such infinitesimal particles, yet so rapidly as to produce the desired liquid metal in charges commensurate with ordinary electric furnace practice, as this particular operation offers. Moreover, the extremely high temperature of the molten metal is such that even highly refractory slags have such fluidity that some of them, which have previously been almost impossible of handling in a furnace, are capable of being run into a slag pit or ladle quite readily.

It is therefore conceivable that one can reduce any metalliferous oxides by passing them through the retort and accumulating a desired bath of molten metal, and thereupon can cease this phase of operation, remove accumulated gangue or slag, and proceed according to ordinary furnace practice with the molten bath of metal for dilution, refinement, alloying, etc.



Open Side Forming Machines Feature Convenient Set-up and Control

EASE of access to the roller dies, quick changing of rolls, compactness and silent operation are features emphasized by the Yoder Co., Cleveland, in introducing its new OW series cold roll forming machines.

Worm and spur gears are entirely inclosed and run in oil. The drive is by motor and multiple vee belts, the motor being either inclosed in the base or mounted at the end of the machine. If desired, the motor may be direct connected to the worm drive shaft. Each machine of the new series is equipped with a roll irrigating device that is driven by a separate motor and serves to flush automatically all the rolls and contact points. The flushing compound is contained in a reservoir welded to the inside of the base. Roller bearings are used throughout the machine; these bearings are accessibly located and are thoroughly lubricated.

Convenient control is a feature. In addition to the usual starting, stopping and reversing push buttons, the electric control box is equipped with an "inching" button which permits the operator to propel the first piece of material through the machine an inch at a time while rolls are being adjusted to their proper position. The push-button control box is mounted on a swinging conduit bracket which may be moved to any position to suit the convenience of the operator.

It is stated that there will always be a demand for machines where the forming is done between the bearing housings, especially when the material is of heavy gage and where the same roll set-up is retained in the machine for long intervals. But where the material is of the lighter gages, and where numerous roll set-ups are required, simplicity of changing rolls is an item; and where the material to be rolled has an irregular projecting side or a wide apron, the open-side machine is said to have distinct advantages.

In this machine the bearings are installed at the end of the shafts outside of the forming rolls and are kept in alinement with the other bearings by the use of a rigid bearing arm irrespective of roll adjustment. The roll pressure is maintained by means of a rigid back-up support provided with an adjustment screw located immediately over the mid-line of the forming rolls, thus equalizing the pressure on the bearings on each side of the forming rolls. The roller bearings and their support at the outer end of roll shafts are quickly detachable, thus permitting rapid roll changing.

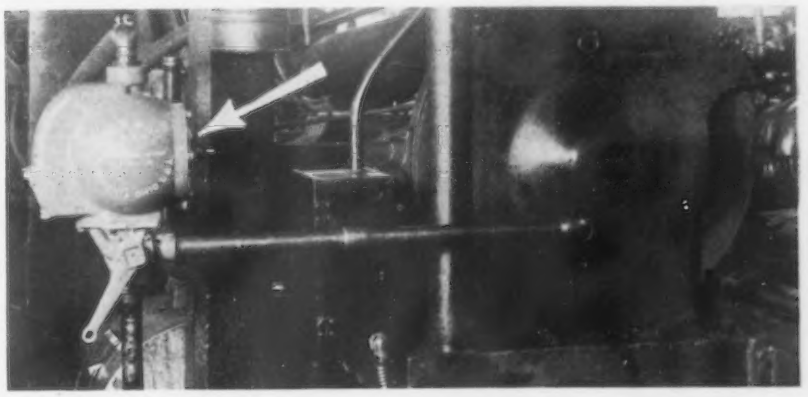
Ample adjustment is provided for the guide rails to accommodate the working of material of unusual width. Between the roll forming dies these machines are equipped with benches on which are securely attached the intermediate guiding, supporting and holding-down devices, thus assuring that the material to be formed will pass through the machine straight and symmetrical and without interruption.

Removes Abrasive Grit From Grinding Coolant

ECONOMIES in grinding have been effected, quality of work improved and production increased by the Fostoria Machine & Tool Co., Fostoria, Ohio, by filtering the coolant used with grinding machines t remove particles of abrasive and metal held in suspension in the solution. By having clean coolant, scratches are said to be eliminated and the work is given a better finish. Filtering permits use of wheels with finer grit and the wheels are said to require less frequent dressings, thus reducing wheel dressings and diamond costs. The filter also is being used on lapping and cylinder honing machines, and it is stated that the finished work is free from scratches because of the absence of grit in the oil.

The filter is mounted on the coolant circulating line of the machine at any convenient point between the pump and outlet to the grinding wheel. It may be used for cooling mixtures of all types and for kerosene and light oils for honing and lapping operations. The filter was designed by N. A. Sorensen, manager, and R. A. Walters, superintendent of the Fostoria crankshaft division of the Hupp Motor Car Corpn., and is being placed on the market by the Fostoria Machine & Tool Co. It is designated as the Sorwal industrial filter.

The coolant, while being pumped to



The filter, located as shown, removes particles of abrasive and metal from the grinding coolant, eliminating scratches from the work.

the point of delivery, passes through a globe that is packed with hair, which removes particles of abrasive and metal from the liquid. The filter is simple in construction and is easy to operate. It is provided with a three-way valve controlled by a handle with an indicator for reversing the flow of the solution to flush the filter. When the filter is in operating position the valve is so set that the solution passes through the filter and on to the outlet to the wheel. To adjust the filter for the flushing position a valve at the outlet to the wheel is closed and the indicator controlling the filter valve is set for flushing so that the flow of the compound is diverted and passes upward through a flushing reservoir, also containing hair for filtering, at the side of the globe, and from this down through the globe and from that to a pipe leading to a drain or sump.

While the filter is being flushed the filtering material is agitated by interior mechanism that is moved back and forth by a lever on the front of the globe. Both the globe and flushing reservoirs have covers which may be taken off to inspect or remove the filtering material. In average work the filter should be flushed every five hours. The frequency of flushing depends, however, on the character of the work, more frequent flushing being necessary when more stock is being removed. In grinding crankshaft pins the filter is flushed twice a day. This requires about two minutes.

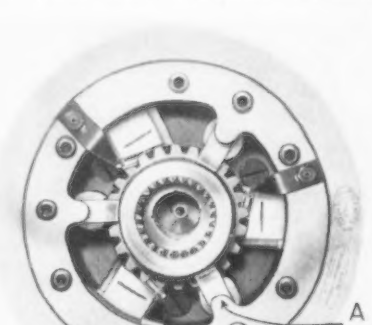
New Swivel Truck Caster

REPLACEMENT of the king bolt by a flexible ball joint is a feature emphasized by the Divine Brothers Co., Utica, N. Y., in announcing the new swivel caster illustrated. This caster, designated as the TonWate, is of two piece design and is made of heat - treated steel forgings, chrome-nickel steel balls and Hyatt roller bearings. The ball joint is seated on the hardened cup of a Dardelet self-locking safety set screw.

Balanced assembly is obtained, the load being distributed on the center and annular balls, approximately two-thirds on the former and one-third on the latter. It is further stated that each ball supports an equal load and resists an equal share of the thrust. The axle of the caster is mounted on Hyatt automotive type roller bearings operating in a split outer race. The main load bearing and swivel bearings operate in a reservoir of lubricant, sealed against dirt and water. The axle also is protected by positive lubrication. Hub guards prevent the entrance of dirt, grit and water, and prevent strings and ravelings from winding around the axle and binding the wheel. A rigid type caster can also be supplied.

Develops Chuck for Holding Helical Gears

FOR helical gears the City Machine & Tool Works, Dayton, Ohio, has developed a new Cimatool Bolender grinding and boring chuck. The chuck may be used also for spur gears. Used on helical gears, it is loaded in the usual manner. When the operator releases the draw-bar, instead of the jaws closing immediately, the gear is automatically brought back by three fingers, one of which is shown at *A*. These fingers swing into place from a position at right angles to that shown, then pull backward, bringing the back side of the gear firmly against three cross-bar buttons located in a parallel plane in the chuck body. The back of gear is previously machined or green ground. It is pointed out that because of the narrow face of many helical gears it has been difficult heretofore to chuck consistently in a true vertical plane, but that this method of automatic location does it quickly and efficiently.



Although the gear is held back firmly to prevent any forward or backward motion, it is permitted a radial movement in every direction so that in the second stage of the automatic operation the chuck jaws come in and accurately center the gear. Use of pins, as shown, permits chucking on the pitch diameter and eliminates the necessity of grinding or locating from the outside diameter. Other means of locating, such as flexible pins, cage of balls or tooth segments, can also be utilized on this chuck.

Micropyrometer Fixes Melting Point

THE melting points and viscosity of metals and alloys may be accurately determined by a new type of micropyrometer, under development in the research laboratories of the Westinghouse Electric & Mfg. Co., East Pittsburgh. Designed particularly to study the characteristics of welding slag, it is expected to find many applications in other fields.

As shown in the illustration, the instrument consists of a heating chamber in the form of a brass cap clamped by thumb screws to a brass base; a heating element, which is a platinum strip, 0.5 in. wide and 0.0005 in. thick; a microscope for viewing the beginning of fusion; and an ardometer for registering temperature. The new instrument is not only believed to be more accurate than similar devices hitherto used, but is portable and occupies only a small fraction of the space required by its predecessors.

In operation a minute test piece of welding slag or alloy is placed on the platinum strip, which is suspended from two insulated terminals, and current is applied from the low-voltage winding of a step-down transformer. The heating chamber is gastight, since the melting point determinations are made in various atmospheres or a vacuum. Observation is made by means of a miscroscope with a magnification of 100 to one through a clear quartz window. When fusion is seen to begin, the current is shut off.

Temperature is automatically recorded on a chart by an ardometer or total radiation pyrometer which collects the heat rays passing through a quartz window and focuses them on a disk containing thermocouples leading to the recording instrument. Readings are taken in millivolts and read in degrees centigrade from a curve previously plotted from readings taken of metals and alloys with known melting points.

Foundrymen Hold Technical Convention in Detroit

MANUFACTURERS, metallurgists and engineers joined hands on May 2, 3, 4 and 5 in Detroit in making the thirty-sixth annual convention of the American Foundrymen's Association a notable affair. For the second time since the early days of the organization no exhibits were staged, the entire time being devoted to sessions in which management and technical problems were discussed. The attendance of over 900 members and guests and the revelation of what has been taking place in recent months in research and development of new processes point to the fact that the foundry industry is earnestly engaged in solving as quickly as possible today's problems which loom especially large on account of the depression.

The success of the convention was due in considerable measure to the work done by the cooperating societies—the Materials Handling and Management divisions and the Detroit section of the American Society of Mechanical Engineers, the Materials Handling Institute, the Gray Iron Institute, the Malleable Iron Research Institute, the Foundry Equipment Manufacturers' Association, the Electric Hoist Manufacturers' Association and the Detroit Foundrymen's Association. With the excepton of the latter, all of these organizations held their own meetings which supplemented the sessions of the A. F. A.

Each of the gray iron, steel, malleable and non-ferrous groups had their own technical meetings for the discussion of their special problems. An address by S. Wells Utley, president, Detroit Steel Casting Co., on "What Price Taxes?" was one of the high spots of the convention. As usual, there were a number of round-table luncheon gatherings and shop operation courses which were well attended. The annual A. F. A. dinner, sponsored jointly with the Foundry Equipment Manufacturers' Association and the Detroit Foundrymen's Association, was another feature.

Brigadier-General T. S. Hammond, president Whiting Corpn., Harvey, Ill., was elected president of the association at the annual business meeting, succeeding E. H. Ballard, general foundry and pattern shop superintendent, General Electric Co., West Lynn, Mass., retiring president; Frank J. Lanahan, president, Fort Pitt Malleable Iron Co., Pittsburgh, was named vice-president. Directors elected for a three-year term were H. Bornstein, director of testing and research laboratories, Deere & Co., Moline, Ill.; S. B. Cuthbert, superintendent of foundries, Edgar Thomson Works, Carnegie Steel Co., Braddock, Pa.; David Evans, president, Chicago Steel Foundry Co., Chicago; Franklin G. Smith, president Osborn Mfg. Co., Cleveland; and Mr. Ballard. The executive secretary, treasurer and technical secretary are to be elected later by the board of directors.

Dr. Gillett Awarded McFadden Medal

Dr. H. W. Gillett, director of the Battelle Memorial Institute, Columbus, Ohio, was presented with the William H. McFadden gold medal of the A. F. A., "for outstanding contributions to the advancement of the metal casting industry." At the same time, a resolution of respect and sorrow was passed in memory of the late Laverne W. Spring, chief chemist and metallurgist, the Crane Co., Chicago, recipient early this year of the association's John A. Penton gold medal.

Citing the statement that "the profits of tomorrow will be made from the waste of today," Mr. Ballard in his presidential address, emphasized the opportunity foundrymen have today to recover much that is unnecessarily wasted both in time and materials. He found encouragement in the fact that many foundries are now making castings with the same simple designs produced by fabrication and are turning out combinations of fabrication and castings at a financial saving. He remarked that the trend which had favored fabricating instead of casting products had proved beneficial to the foundrymen, in that designing engineers have had their attention directed to casting design and the foundryman in turn has been made to realize his responsibility in assisting in the simplification of designs and the production of superior castings at lower costs.

▲ ▲ ▲

Governmental Costs Must Be Reduced

"There has never been a time in human history when so many people in so many parts of the earth have had such a feeling of fear and insecurity," said S. Wells Utley, president, Detroit Steel Casting Co., in addressing the Foundry Equipment Manufacturers Association at Detroit, May 4. "This has been brought about by the riotous extravagance of every government on the face of the earth.

"Every government has been possessed by the insane idea that, by withdrawing wealth from productive enterprise and by employing it in governmental activities or doles, it could thereby increase wealth and the happiness of the people. Compared with 1913 the public expenditures of the United States have increased 402 per cent. The cost to the nation of the World War for the 19 months in which we were engaged was 22.6 billion dollars. The cost of running the peace-time governments of the United States for the last 24 months was 27.5 billion dollars.

"We have reached the extraordinary situation where the ownership of property has become a liability and not an asset. With local governments plundering the homeowner and the corporation and with the Federal Government taking away a considerable part of what is left, it is no wonder that business hesitates and unemployment stalks the land.

"Governmental costs must be reduced, non-essential services must be curtailed, budgets must be balanced by lowering expenditures, not by constantly finding new methods of taxation."

▼ ▼ ▼

Silicon and Manganese Briquets Used in Cupola

Beneficial results are obtained in a cupola and high-grade castings can be produced at a saving in cost by the use of silicon and manganese briquets, said Lynn H. Ramson, Keystone Driller Co., Beaver Falls, Pa., in a paper entitled "The Use of Silicon and Manganese Briquets in the Cupola." He presented the results of a number of gray cast iron heats made by the addition of these briquets, while heats of similar analyses were made employing larger percentages of pig iron in the charge to adjust the analyses.

In a paper on "The Use of Molybdenum in Cast Iron," J. Kent Smith and E. R. Young, Climax Molybdenum Co., Detroit, presented a partial survey of the field now occupied by molybdenum in the iron foundry and an exposition of some of its present-day accomplishments in various branches of the gray iron industry. To illustrate some of the points brought out in their paper, the authors showed on a screen some microphotographs which were the results of examination under oil immersion at magnifications

as high as 3600 diameters and which were recorded photographically in the natural colors of their constituents. The successful recording of these microphotographs is equivalent to reproducing the image of an object magnified almost in the exact order of the enlarging of a postage stamp to the size of a city block.

High Test Cast Iron Discussed

Presenting a paper on "High Test Iron," H. H. Judson, Goulds Pumps, Inc., Seneca Falls, N. Y., told about a series of experiments conducted in his company's foundry to develop a high-strength iron suitable for use in the fluid ends of high-pressure pumps, especially those in oil line pumps. The principal idea behind the experiments was the determination of the effects upon the strength of the various common elements occurring in cast iron.

"A Contribution to the Study of Martensitic Quenching of Alloy Cast Irons" was the title of the exchange paper of the French Technical Foundry Association prepared by Marcel Ballay, French National Aeronautical College, Paris. The author said that several methods are available for obtaining machineable castings of high hardness. One can start with an iron machineable as cast which, after machining, is hardened by quenching, followed or not by drawing. However, due to low resistance to deformation, the iron must be cooled slowly. Oil quenching can be employed only in special cases, as cracking may occur. For castings of more complex design, it is impossible to quench in oil or in still air. It is necessary to resort to irons which are hard as cast. Suitable regulation of the analysis of the iron for the melt sometimes makes it possible to obtain a sorbite relatively hard as cast, but which can be machined without difficulty.

Cast Iron Borings Used in Open-Hearth Furnaces

Because of the difference in current prices of pig iron and cast iron borings, the use of the latter in the open-hearth furnace will save considerable money in plants operating foundries and machine shops from which borings segregated as to composition can be obtained, declared T. L. Joseph and C. E. Wood, United States Bureau of Mines, Minneapolis, in a paper about "The Open-Hearth Furnace as a Means of Recovering Cast Iron from Borings." The results of the experiments mentioned by the authors show that cast iron borings can be melted in an open-hearth furnace, provided they are protected before and after melting with slag and small coke. The weight of the metal recovered will be about 90 per cent of the weight of the borings charged. It is feasible to cast the metal direct from the open-hearth furnace, since the iron can be superheated if desired and chemical specifications met.

H. W. Highriter, Malleable Iron Research Institute, Cleveland, and R. Schneidewind, University of Michigan, Ann Arbor, Mich., presented the results of a study on short-cycle malleabilizing made under the auspices of the committee on industrial gas research of the American Gas Association. D. J. Reese, Whiting Corpn., Harvey, Ill., told about the results of melting high-test iron in the Brackelsberg furnace, while W. H. Spencer and M. M. Walding, American Cast Iron Pipe Co., Birmingham, described the effects of 11 metals or alloys on the physical properties of gray cast iron. T. Holland Nelson, consulting metallurgist, Philadelphia, told about the manufacture of rustless steel castings. The exchange paper of the Institute of British Foundrymen, prepared by H. J. Young, presented "Some Thoughts Concerning Mixtures, the Pearlite Process and Heat Treatment of Cast Iron."

H. W. GILLETT
McFadden Medalist

Apprentice Program Pays Dividends

J. Franklin Carlz, assistant to vice-president, Clark Brothers Co., Olean, N. Y., told about his company's experience during the past five years in training apprentices, the total cost per year per apprentice having been $176.54. His company is convinced that the training of apprentices is the only way to get a sufficient number of skilled foundrymen and that organized apprenticeship means less labor turnover and the establishment of a group of loyal employees. The plan provides a training school for potential foremen and from a safety standpoint reduces industrial accidents. He said that "when men are trained in the methods and policies of our own plant they become familiar with our product, our service, our internal good will and our customers." W. E. Rutz, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., outlined the successful foundry apprenticeship program carried out by his company.

Mold Control Is Important

Mold control is an important connecting link between sand control and casting defects, stated H. W. Dietert, United States Radiator Corpn., Detroit, in a paper on "Mold Condition Control" at the session on sand research. The application of mold control in the foundry will increase the value of sand control. A mold must be correctly rammed to produce a casting of satisfactory quality. Many defective molds are caused by a variation in the quality of the molding sand. Mold hardness may be defined as the ability of the mold surface to resist deformation when supporting a given load. An increase in mold hardness decreases swells and strained molds.

Mr. Dietert pointed out the methods of testing mold hardness and discussed the effect of moisture content and permeability on mold hardness. He concluded that mold hardness decreases with an increase of moisture beyond the well tempered range, that it increases with an increase in strength and that it decreases slowly with a gain in fineness. A few defects of a soft mold are overweight castings, swells, strains, poor finish and gate swells causing scrap castings due to unequal feeding which may result in broken molds, the gate breaking into casting, cuts and washes.

A new microscopic method for determining bond distribution in simple synthetic molding sands was described in a paper by A. H. Dierker, research engineer, engineering experiment station, Ohio State University, Columbus,

Tax Resolution Adopted at Business Meeting of A. F. A.

WHEREAS, American castings manufacturers, in their responsibility to the public, their employees and their stockholders, are confronted by a stupendous problem of reconstruction, and

Whereas, an appalling obstacle to their effective effort is the menace of increasing taxes incident to waste and extravagance in Government, as shown in the able address of Past President S. Wells Utley during the sessions of this convention, now be it

Resolved, that the American Foundrymen's Association, representing and speaking in behalf of the entire foundry industry of the United States, does strenuously protest and urge upon its representatives the elimination of wasteful expenditures of taxes as now existing in the Federal Government, and be it further

Resolved, that the association urges upon its individual firms and their representatives the peril of the situation and calls upon them actively to bring to the attention of their national representatives in Congress the demand on behalf of their thousands of employees, stockholders and the public served by the foundry industry for immediate and drastic economy.

Ohio. Under ordinary conditions it is difficult to distinguish under the microscope the appearance of the bonding material from that of the sand grains. Immersion of the sample in refractive oil, however, causes the clay to stand out in relief and its distribution therefore can be defined. The time for milling synthetic sand mixtures ranges from 3 to over 14 min., depending on the size of the sand grains. During the investigation it was found best to examine sand mixtures with the minimum of agitation and while they were still damp.

Handling Engineers and Executives Discuss Practice and Policy

ONE of the noteworthy results of the Detroit meeting was the evident advancement of co-operative effort in the mechanical handling industry. With a combined attendance of over 200, executives and engineers representing a broad cross-section of the entire handling industry met to discuss current problems and to perfect the coordination of organizations within the industry.

The sessions brought together the materials handling division of the A.S.M.E., the recently organized Materials Handling Institute, which comprises over 80 of the leading manufacturers of equipment, and the Electric Hoist Manufacturers' Association.

Ways and means were discussed for advancing the industry through co-operative educational effort, along both engineering and sales lines, in which the institute and the A.S.M.E. can harmonize and coordinate their efforts to this end by a suitable functional division of duties.

Technical sessions were held during two days, culminating in a dinner and smoker given by the Materials Handling Institute in cooperation with the handling division of the A.S.M.E. F. E. Moore, of Mathews Conveyer Corpn., Elwood City, Pa., president of the institute, was chairman of the dinner meeting. The speakers were R. L. Lockwood, of the United States Department of Commerce, who outlined and analyzed the possibilities for profitable organized action, and John H. Van Deventer, editor, THE IRON AGE, who discussed the present industrial situation in its relation to the handling industry.

Technical Papers

A number of informative technical papers on various handling subjects were presented at sessions conducted by the materials handling division of the A.S.M.E. Of particular interest because of its wealth of original source material was the paper, "Relative Wear of Metals by Abrasion," by C. R. Weiss, chief engineer, the Link Belt Co., Indianapolis. This research covered a period of nine years of work in attempting to determine the relationship between abrasive resistance to wear of heat-treated, case-hardened and stainless steels of many compositions and with a variety of heat treatments. While not purporting to be representative of abrasive action under a broad range of conditions, this study, as applied to its particular range, is a valuable contribution to engineering data. In general, the results indicate that resistance to abrasion varies almost directly with Brinell hardness.

The close alinement of modern management and materials handling was brought out very definitely by W. G. Reichert, engineer, Singer Mfg. Co., Elizabethport, N. J., in his paper, "Management Policies and Practice in a Continuous Production Gray Iron Foundry." This paper, which was read by George E. Hagemann, chairman of the A.S.M.E. Manufacturers' Committee, described the continous and coordinated system of handling molding, core making, pouring, cooling, cleaning, etc., of castings at the mechanized foundry of the Singer Mfg. Co.

Proper organization and conduct of maintenance in connection with foundry handling equipment was reviewed by Thomas A. Bissell, assistant editor, *Maintenance Engineering*, in a paper entitled, "Preventive Maintenance of Materials Handling Equipment in Foundries." Good practice was presented in connection with electric cranes and hoists, conveyors, motors, sand handling and other equipment.

Crawler Crane Performance Standards

Specific progress in the standardization of the ratings of crawler cranes was reported by the sub-committee of the handling manufacturers' committee, of which F. A. Smythe, president, Thew Shovel Co., is chairman. The recommendations of the sub-committee were approved and will be considered for approval by the society. Final accord was reached with the Shovel and Crane Manufacturers' Association as to considering the fall block a part of the load in the case of crawler-type cranes, as distinguished from the practice in connection with locomotive cranes.

A preliminary report on the capacity rating of containers, such as ladles, shovels, buckets and bins, was submitted by W. E. Farrell, president, Eastern Car & Construction Co., the chairman of the sub-committee handling this matter. Considerable data of an informative nature was included as to the practice of 32 manufacturers, but recommendations for standardization could not be made without considerable further exchange of opinion in the industry, due to the wide variety of present practice.

An appeal on the part of a handling equipment user for standardization of controlling dimensions of chain conveyor elements, overhead trolley hangers, standard gravity rollers and wheel conveyors was presented by Matthew W. Potts, secretary, materials handling division, A.S.M.E. Attention was called to slight dimensional differences in the products of various manufacturers which prevent the user from securing interchangeability.

A report upon materials handling lectures in colleges was also presented by Mr. Potts, this report showing the need for considerable educational work, now lacking in most institutions, for the purpose of informing our future engineers as to the principles and practice of modern industrial handling.

Handling in Non-Ferrous Foundry

At the final technical session, D. G. Anderson, foundry engineer, Western Electric Co., and B. F. McAuley, materials handling engineer of the same company, described the equipment and methods used for sand handling, conditioning and other operations in the brass foundry of the Hawthorne Works of Western Electric Co. The results secured have been such, in the opinion of the authors, as to justify the installation of mechanical handling in a small brass foundry.

"Materials Handling for Miscellaneous Castings" was discussed in a paper of that title by F. D. Campbell, Eastern Corpn., New York, and "Monorail Materials Handling and the Foundry" by J. B. Forker, Osborn Mfg. Co., Cleveland.

Swann Chemical Co., Birmingham, has established sales offices in five industrial centers and placed sales representatives in 10 other cities in the United States. This expansion program resulted from an extensive business survey to determine uses for newly developed products and new applications for old products. The information developed thus far, according to Theodore Swann, president of the company, has enabled the company to increase its business month by month and has proved the efficacy of an aggressive expansion policy.

Management Faced by Forces Beyond Its Control

THE effective techniques developed by management are not sufficient to assure success under all conditions, said Ralph E. Flanders, vice-president, Jones & Lamson Machine Co., Springfield, Vt., and chairman of the American Engineering Council's committee on the relation of consumption, production and distribution, in an address on "The Management Point of View on Economic Planning," before the annual convention of the American Management Association, held in New York last week.

"Management has studied questions of product, plant and equipment, personnel selection and direction, wage incentives, production control, sales and advertising management and proper financial control. To meet broader problems trade associations have been formed; these by approved codes of ethics restrain unfair competition," said Mr. Flanders. "By gathering and publishing production and sales statistics they may check unwise expansion. By establishing uniform cost systems they discourage unprofitable prices.

"There are other types of disturbance which even the trade association cannot easily cope with, such as the obsolescence of whole industries by new developments, and by radical changes in fashions," he declared. "But the greatest uncontrolled factor is dependence on general business conditions.

"Industry's necessary activities tend to set up disturbing forces. Economy in production causes labor unemployment and reduces purchasing power. The laying aside of large cash reserves tends to withdraw funds to activities which do not result in the purchase of goods.

Process of Boom and Collapse Is Clear

"The actual process of boom and collapse is clear," said Mr. Flanders. "Accumulated profits of individuals and companies seek investment. There being no expansion of purchasing power to correspond, profitable new investment does not appear. But the emergence of profits enhances the security market which absorbs them in speculation. This pyramids into a speculative structure whose foundation is undermined by the withdrawal of these funds from purchasing power. The structure collapses.

"The banking mechanism will take no responsibility for control," he continued. "It is engaged in an essentially short-view business undertaking. Business is helpless. The Government is the remaining resource.

"The Government can do certain things to maintain the balance. An arbitrary shortening of the working hour is one possibility which is hopeful, but highly controversial. Another, as hopeful, but less controversial, lies in its budgeting and construction policy.

"In the present situation measures for expanding and easing credit are admirable, but are business operations in sight which can employ the credit?" Mr. Flanders asked. "Extreme budget balancing throws men out of work and decreases purchases of goods. This works directly opposite to credit expansion and may negative its effect. It is most unfortunate that budget balancing and credit expansion are simultaneous. The latter should have been effected months ago, in which case Governmental contraction would not have been serious.

"The desirable policy," Mr. Flanders said, "is to withdraw from extremes of budget balancing; to discriminate between current receipts and expenditures and capital expenditures; to finance the latter by borrowing; in particular to search out productive Federal, State and municipal expenditures such as public buildings to replace rented quarters, reforestation, toll bridges, water works and perhaps some means of financing large scale housing operations."

Governmental budgeting should be based on the business cycle, Mr. Flanders believes, not on the fiscal year. "The enormous retirement of Government bonds up to 1930 should have developed a 'line of credit' for borrowing now," he said. "Bankers and the investing public must change their psychology. Balancing the Governmental budget within the fiscal year, particularly for capital expenditures, is puerile.

"Long-time budgeting policies by the Government can compensate for unavoidable unbalancing operations of individuals and businesses," Mr. Flanders stated in concluding. "It is the responsibility of business men as citizens to see and understand, and not be moved by waves of mass psychology."

Fabricator of Rustless Steel Opens New Plant

The Alloy Products Corpn., located for the past three years at Milwaukee, has moved to a new plant at Waukesha, Wis. Occupying a floor space of 35,000 sq. ft., the plant makes it possible for the company to give faster and more complete service to purchasers of its equipment without any great increase of overhead.

The new plant is of steel and concrete construction with a saw-tooth roof which gives daylight working conditions to all parts of the shop. Included in the general plant layout is a forge and fitting shop where the company will make all of its own Lifetyme metal fittings which are used in its equipment.

There is a light and roomy drafting department incorporated in the new layout, as well as pattern shop, polishing room, welding room and insulating and painting room.

The grinding room is equipped with high-speed grinders which operate at a speed of 21,000 r.p.m. Installation of 25 separate special grinders has been provided for. The grinders operate from a frequency changer which was installed especially to handle the high speed required for this work.

The welding department is said to have the greatest capacity for butt welding of any rustless steel fabricating plant in the country. Over 600 ft. of butt welding can be handled each working day in the new plant, the department being specially wired for a power of 800 amp.

All heads, both dish and flange, up to 10 ft. in diameter will be made in the new shop and additional special equipment is being installed for tube and pipe channels and angle and bar bending.

The Alloy Products Corpn. was a pioneer in engineering and fabricating rustless steel and other alloys. It now designs, fabricates and constructs commercial alloy metal equipment for the dairy, food, chemical, packing, canning and drug industries. The complete line of dairy equipment includes truck tanks, pasteurizers, holding tanks, storage tanks, coolers, coil vats, hot wells, car tanks, weigh cans and whey tanks. These are constructed of Lifetyme metal, because of its insolubility which makes it especially suitable for use where the acidity or corrosive action of the product must be guarded against.

Steel Barrel Output Higher in March

WASHINGTON, May 10.—Making an increase of 80,676, the March production of steel barrels rose to 448,148 units from 367,472 in February, according to reports received by the Bureau of the Census from 27 establishments. Shipments increased 78,225 units to 448,107. Orders at the end of the month totaled 40,360 barrels, against 40,319 at the end of February.

Business Slump Aggravated By Reckless Competition

Supply Manufacturers and Distributers Urge Congress to Investigate Anti-Trust Laws and Pass Amendments

RECKLESS competition has aggravated the problems of the depression in the belief of the 420 member companies of the American Supply and Machinery Manufacturers Association, the National Supply and Machinery Distributers Association and the Southern Supply and Machinery Distributers, which adopted a resolution at their joint convention in Cincinnati, May 2 to 4, calling upon Congress to appoint a committee to investigate the working of our anti-trust laws to the end that some means may be found to amend these laws so that destructive competition can be eliminated or minimized.

Declaring that "the consumer is not entitled to a price that has not first afforded a fair profit to every necessary and efficient agency of both manufacture and distribution," the resolution stated that under existing laws the sellers are "denied equal privileges with buyers in determining economic levels of price and production." It was declared that correction of this condition is necessary for the restoration of economic equilibrium. The resolution in full is printed in an adjoining column.

Nelson B. Gaskill, former member of the Federal Trade Commission, in an address to the joint convention, stated that recovery of a normal business volume at present price levels would not restore prosperity. While he did not suggest price pegging or illegal price agreements, he pointed out that the present socialistic trend in government, which causes an increasing tax burden on industry, is directly opposed to the anti-trust law theory of promoting competition. Mr. Gaskill said that industry should be permitted to assure itself a profit by requiring the individual seller to observe his cost as the minimum selling price. "Such a system," he pointed out, "would substitute for the present unlimited freedom of competition a new character of competition, regulated to conserve the public interest in profit."

Kelly-Capper Bill Advocated

Advocacy of the Kelly-Capper bill or some similar means of giving legalized support for manufacturers' resale prices came from Frank Collins, president, Toledo Pipe Threading Machine Co., Toledo, Ohio; Wylie K. Lee, president, Clipper Belt Lacer Co., Grand Rapids, Mich., and William E. Cross, vice-president, Victor Saw Works, Inc., Middletown, N. Y.

David C. Jones, Lunkenheimer Co., Cincinnati, president of the manufacturers' organization, presided at the opening joint session. H. H. Kuhn, president of the National association, and Fred W. Glover, president of the Southern association, spoke at this meeting.

New Officers Elected

Much of the time at the convention was devoted to group meetings and to discussions of various distribution problems. The convention was concluded by the annual elections of officers, which resulted as follows:

The National Supply and Machinery Distributers Association elected H. E. Ruff, Cleveland, president; E. B. Hunn, New Haven, Conn., and W. T. Todd, Jr., Pittsburgh, vice-presidents; H. H. Kuhn, retiring president, Akron, Ohio, chairman of the executive committee. Other members of the committee elected were R. C. Duncan, Minneapolis, Minn.; Wendell H. Clark, Chicago, and A. B. Paul, Buffalo.

The Southern Supply and Machinery Distributers Association elected W. M. Given, Birmingham, president; W. W. Taylor, Pine Bluff, Ark., and C. C. Krueger, San Antonio, vice-presidents. Fred W. Glover, Charlotte, N. C., retiring president, was made chairman of the executive committee, to which were added T. W.

Destructive Competition Assailed in Resolution

BELOW is the text of a resolution adopted at the joint convention of the American Supply and Machinery Manufacturers Association, the National Supply and Machinery Distributers Association and the Southern Supply and Machinery Distributers Association:

We believe that one of the principal causes of the present distressed condition of industry is the demoralization from reckless competition occasioned by the inability of competing sellers to cooperate lawfully and effectively, not alone in the development and use of our natural resources but equally so in the general business of manufacture and distribution.

Destructive competition, whether due to overcapacity or to inequality of privilege under the law between buyers and sellers, destroys earning capacity and creates industrial maladjustment. Preservation of payrolls and investments is the imperative condition—precedent to the preservation of mass purchasing power, to the permanent supply of consumer needs and to keeping open the essential source of all public taxing power. Since earning must precede spending it is therefore the primary necessity of a nation's economic welfare.

Court interpretation of our anti-trust laws protects buyers by restricting the privileges of sellers. Sellers are thus denied equal privilege with buyers in determining economic levels of price and production. Correction of this prevailing legal emphasis upon consumer welfare must precede restoration of industrial equilibrium. Since the producing functions of capital and labor represent one half of the entire public interest we hold that economically the consumer is not entitled to a price that has not first afforded a fair profit to every necessary and efficient agency of both manufacture and distribution.

We, therefore, urge:

(1) That a committee be immediately appointed by Congress carefully to investigate the workings of all phases of our anti-trust laws; and (without sacrificing the present needed and intended prohibitions of our anti-trust laws against monopoly, oppression of competitors tending thereto, and unfair trade practices) to propose such legislation as will permit cooperative agreements between sellers to such extent as may be necessary.

(a) To avoid destructive competition.
(b) To avoid wastage of materials.
(c) To help stabilize payrolls.
(d) To avoid the constant incentive to capital concentration otherwise inevitable.
(e) To preserve earnings—the fountain source of all tax revenues.
(f) To restore industrial equilibrium by restoring equality of privilege between buyer and seller.
(g) To promote the public interest by giving balanced weight to the needs of capital and labor at least equally with that of the consumer.

(2) That, pending this determination of the proper form of permanent legislation Congress pass before adjournment of the present session, an "Emergency Industries Preservation Act" conveying this necessary relief temporarily under the supervision of the Federal Trade Commission and in conformity with its judgment of the public interest. We particularly point out that during the interim gross abuse of the consumer interest is practically impossible.

In the belief that this resolution accurately reflects the views of the preponderant mass of this country's producers, distributers and workers, we further instruct our secretaries to send a copy hereof to each member of Congress, to the President and members of his Cabinet, to the Justices of the Supreme Court, to other trade associations, and to the trade and business press.

Lewis, Memphis; G. C. Weeks, Monroe, La., and G. C. McAllester, Macon, Ga. Alvin M. Smith, Richmond, Va., was reelected secretary.

The American Supply and Machinery Manufacturers Association elected H. F. Seymour, Cleveland, president, succeeding David C. Jones, Cincinnati. J. Harvey Williams, New York, and W. T. Kilborn, Pittsburgh, were elected vice-presidents. William H. Fisher, Chambersburg, Pa., was elected treasurer, and R. Kennedy Hanson, Pittsburgh, was reelected secretary. Executive committee elected includes G. H. Haplin, St. Paul; Wylie K. Lee, Grand Rapids, Mich.; C. O. Drayton, Worcester, Mass.; K. G. Merrell, South Bend, Ind.; B. A. Keiley, Passaic, N. J., and W. C. Allen, Towson, Md.

Technical Program for Steel Institute Meeting

The American Iron and Steel Institute has arranged the following papers for the technical session of its forty-first general meeting, to be held at the Hotel Commodore, New York, on Thursday, May 19:

"Mining Taxation in the Lake Superior District," Clarence B. Randall, vice-president, Inland Steel Co., Chicago.

"A Modern Conception of Steel Quality," H. W. Graham, general metallurgist, Jones & Laughlin Steel Corpn., Pittsburgh.

"The Economic Value of the Steel Industry to the United States," George H. Charls, president, National Association of Flat Rolled Steel Manufacturers, Cleveland.

"Non-destructive Testing Methods in the Iron and Steel Industry," Dr. Robert Mehl, assistant director of research laboratory, American Rolling Mill Co., Middletown, Ohio.

"Stainless Production—Equipment and Method of Manufacture," E. C. Smith, assistant district manager, Central Alloy Division, Republic Steel Corpn., Massillon.

"Flexibility in the Use of Blast Furnace and Coke Oven Gas in the Steel Plant," C. A. Meissner, manager of coke works, Weirton Steel Co., Weirton, W. Va.; Julius Strassburger, assistant chief engineer, Weirton Steel Co., Weirton, W. Va.

Steel Ingot Output At New Low in April

STEEL ingot output in April declined more than 8.7 per cent from that of March, based on the daily rate, which was 47,685 gross tons last month, as compared with 52,253 tons in the preceding month. The total for April was 1,239,811 tons, against 1,410,830 tons in March, which had one more working day.

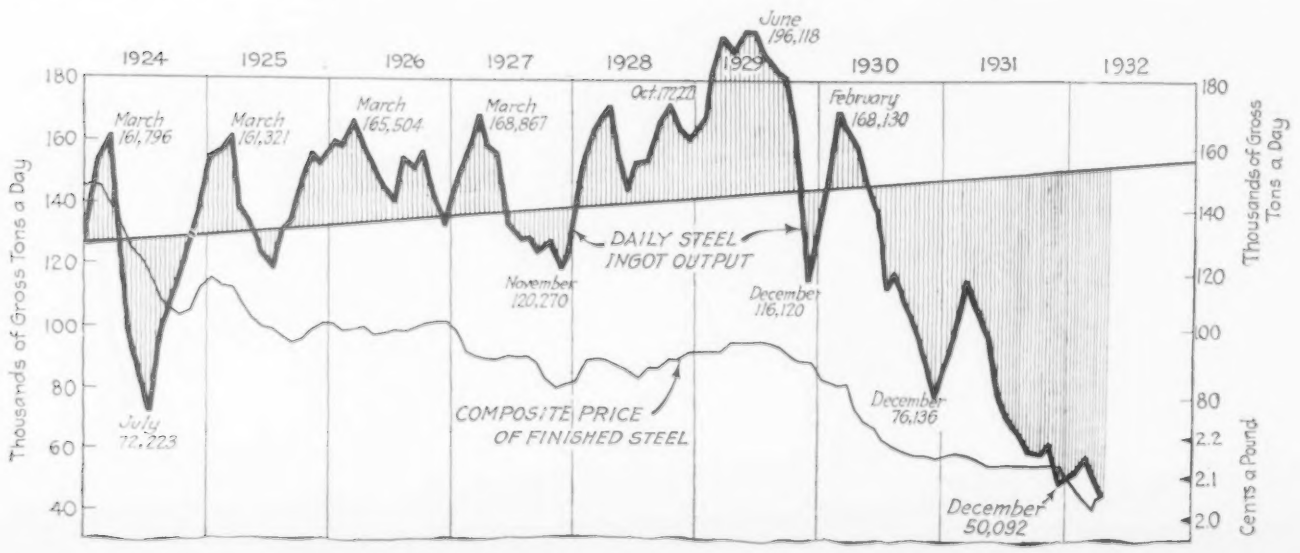
The April output was almost 5 per cent below that of last December, which previously had held the record as the low production month of the depression period. The total output in December was 1,302,399 tons.

Not since July, 1921, which was the nadir of that year of depression, has the steel industry's rate of output been so low. The daily rate at that time was 36,713 tons. In only two months of 1921—June and July—was the daily output below that of the past month. With the exception of 1921, the rate has not been so low since August, 1908.

Based on the American Iron and Steel Institute's capacity ingot rating of 66,069,570 gross tons, the April output was 22.52 per cent of capacity, against 24.68 per cent in April, 27.57 per cent in February, 26.54 per cent in January and 23.58 per cent in December. The average for the four months of this year is 26.31 per cent. The average output for all of 1931 was 37.69 per cent.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Gross Tons)

	Reported by Companies Which Made 95.21 Per Cent of the 1930 Ingots		Calculated Output of All Companies		No. of Working Days
	Open-Hearth	Bessemer	Monthly	Daily	
Total, 1930	32,405,466	5,020,588	39,286,287	126,322	311
1931					
January	2,044,298	296,620	2,458,689	91,063	27
February	2,085,529	296,972	2,502,366	104,265	24
March	2,504,060	346,139	2,993,590	115,139	26
April	2,275,404	316,668	2,722,479	104,711	26
May	2,083,833	301,639	2,505,485	96,365	26
June	1,730,109	246,365	2,075,910	79,843	26
Six months	12,723,233	1,804,403	15,258,519	98,442	155
July	1,570,776	225,030	1,886,153	72,544	26
August	1,462,720	174,380	1,719,462	66,133	26
September	1,274,321	199,151	1,547,602	59,523	26
October	1,320,158	195,943	1,592,376	58,977	27
November	1,276,906	240,441	1,593,684	63,747	25
December	1,069,468	170,546	1,302,399	50,092	26
Total, 1931	20,697,582	3,009,894	24,900,195	80,065	311
1932					
January	1,230,661	160,633	1,461,290	56,203	25
February	1,232,568	157,067	1,459,547	58,382	25
March	1,149,307	193,944	1,410,830	52,253	27
April	1,036,227	144,197	1,239,811	47,685	26



Low-Price Automobile Makers Are Gradually Expanding Output

DETROIT, May 10.—With Ford expanding its output more rapidly than some observers had believed possible, it now seems likely that assemblies for the entire industry this month will be at least 180,000 units, against an estimated 145,000 in April. Chevrolet, as well as Ford, contributed materially to last month's improved showing over March, as it turned out 55,432 cars, compared with 38,890 cars the previous month.

It is encouraging to note that Chrevrolet had to step up its manufacturing activities several times in April as the result of betterment in retail sales. Up to May 1, Chevrolet had built over 260,000 of its 1932 series. That Chevrolet's April production is not out of proportion to demands of the retail market is shown by the fact that new car sales in the first 20 days of the month amounted to 38,000 units and for the entire month are thought to have passed the 50,000 mark. Plymouth likewise has been responsible for boosting the industry's output, with 2000 cars completed in April and about the same number scheduled for May.

It is estimated that the three low-priced makers—Ford, Chevrolet and Plymouth—accounted for 65 to 70 per cent of last month's total for the industry and, as Ford increases its activities, the percentage of these three companies will mount. Most of May's gain over April will be accounted for by Ford.

Year's Peak in June or July

The automobile industry is pretty well agreed that the year's peak will not come before June, and indications are that June and July will be the top months. It is possible that assemblies may be pushed up to 250,000 cars a month, but not even the most optimistic person feels that it will rise above that figure.

By the end of last week Ford's output is reported to have reached 1600 cars a day, with a production of 2800 a day by the middle of this month still its goal. It is understood that about 1000 cars a day are the V-eight and the remainder the improved four. It is believed that Ford will have little difficulty in attaining its aim of manufacturing 5000 cars this month, and the total may be even higher. The only steel orders placed by Ford the past week were for pick-up lots. The next steel "buy," which should be somewhat larger than the last one, is not expected for at least 10 days. Ford is operating six out of 10 open-hearth furnaces at its Rouge plant. Branch assembly plants are getting into production as rapidly as possible. Dealers still are having a hard time getting cars, but more of them are appearing on the streets of Detroit daily.

Fisher Body Corpn. bought a small tonnage of sheets for its Cleveland plant the past week. The volume was not large because considerable steel originally purchased for use in Pontiac cars has been diverted to Chevrolet, where General Motors is finding its chief support for current operations. Pontiac, Buick and Oldsmobile are holding down assemblies to relatively small numbers of cars. In the quality group the retail market has been unresponsive, with the result that factory activities are dragging. Each week the fact becomes more evident that the depression is taking a heavy toll in every price class, except the light cars, where the battle will be intensified by mid-summer.

New Eight To Compete with Ford

One of the industry's major builders is preparing a straight eight to compete directly with Ford's V-eight. Just when this will be presented is not known, but it will not be before Ford gets into heavier production and begins to dig deeply into the low-price field. It is believed the cylinder blocks for the new car will be made in a large foundry in the Saginaw district. A second maker now offering two cars to the public will add a third about July at a price in the Ford and Chevrolet range. This company is motivated by the desire to obtain volume in its plant and thereby reduce manufacturing costs. The full scope of the fight in the light car field will not be revealed for at least another 60 days. Incidentally one of the two new cars yet to be shown is said to have an all-steel body and frame built as a unit.

Benefiting from the upward turn in automobile activities, the local steel plant is faring considerably better than the industry as a whole. Water shipments of steel are coming into the Detroit district from Buffalo, Cleveland and Chicago, one steel mill bringing in a boat a week from Buffalo. The latest development in water transportation is the hauling of loaded automobile truck trailers which are run onto the top decks of boats and driven off without delay at the destination.

Steel Prices Well Held

Steel prices are being held fairly well in this market and little evidence has come to light of an attempt to use the reduction in steel wages and salaries as a wedge to obtain concessions. The practice of quoting a delivered price on steel bars of $4 a ton above the Pittsburgh base price is working out well and already is firmly entrenched.

There has been considerable comment about the low prices made by malleable castings makers in an effort to get a portion of the present available business. In some cases it is believed that prices now being received by malleable foundries are at least $10 a ton below production costs.

Open-Hearth Meeting at Meet May 18

A Connecticut inter-section meeting of the American Society of Mechanical Engineers will be held at the Waterbury Country Club, Waterbury, Conn., on Wednesday, May 18. The morning will be devoted to golf and the afternoon to plant inspection trips. A luncheon and a dinner meeting are planned at which Willard E. Freeland, Freeland, Bates & Lawrence, Inc., Boston, will speak on "Organizing for the Reconstruction Period." Plants to be open for inspection include the rolling mill division of the American Brass Co. and the Scovill Mfg. Co.; the Waterbury Farrel Foundry & Machine Co.; Bristol Co.; Waterbury Rolling Mills; Waterbury Tool Co.; Rowbottom Machine Co. F. G. Purinton, Waterbury, is chairman of the general committee.

American shipyards were building or were contracted to build for private owners 81 vessels aggregating 174,087 gross tons, as of April 1, compared with 84 vessels totaling 228,967 gross tons on March 1. Of the vessels planned or under construction on April 1, 75 were steel ships aggregating 172,000 tons, while six were wooden craft accounting for 2087 tons.

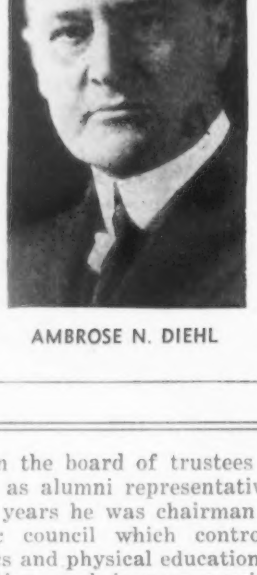
... PERSONALS ...

AMBROSE N. DIEHL, a vice-president of the United States Steel Corpn., has been appointed president of the corporation's Pacific Coast subsidiary, the Columbia Steel Co., effective June 1, when he will succeed A. T. DEFOREST, whose retirement will occur under the corporation's pension plan.

Mr. Diehl has had a long and varied career with the Steel Corporation and its subsidiaries. He began as a chemist in the laboratory of the Carnegie Steel Co.'s Duquesne works in 1899, two years before the formation of the Steel Corporation. The same year he was transferred to the blast furnace department, and six months later was made assistant blast furnace superintendent, and became head of the department in 1901. In 1915 Mr. Diehl became assistant general superintendent of the Duquesne works, and after a year and a half in this position he was transferred to the Pittsburgh offices of the Carnegie company as assistant operating vice-president. He returned to the Duquesne works as general superintendent in 1918, continuing in this position until 1925, when he was made operating vice-president of the Carnegie company in charge of the Pittsburgh district. He became a director of the Carnegie Steel Co., the Sharon Coal Co., the Carnegie Natural Gas Co., the Bessemer Electric Power Co., the Clairton Steel Co. and the Clairton By-Products Co.

While residing in Pittsburgh he was also prominent in a number of civic movements, having served as vice-president of the Chamber of Commerce rivers and harbors committee and as a member of the Pittsburgh City Rivers and Harbors Planning Commission and the Pennsylvania World's Fair Commission. While at Duquesne, he was president of the Duquesne Trust Co., Duquesne Library and chairman of the Duquesne chapter of the American Red Cross. He is a thirty-second degree Mason and served as worshipful master of the Duquesne lodge. He is a member of several Pittsburgh clubs, and has been prominent in the affairs of the American Iron and Steel Institute, the American Institute of Mining and Metallurgical Engineers and the Engineers' Society of Western Pennsylvania, having served as a director of the two last-named organizations. He has presented a number of papers before the American Iron and Steel Institute. He is a member of the executive committee of the Carnegie Hero Commission.

Mr. Diehl received his bachelor of science degree in 1898 at Pennsylvania State College, where he was president of the athletic association and received his letter in football and track. He is a member of the Sigma Chi fraternity, and since 1917 has been on the board of trustees of his college as alumni representative, and for 10 years he was chairman of the athletic council which controls the athletics and physical education of the institution, and is now serving the executive board of trustees of his alma mater.



AMBROSE N. DIEHL

❖ ❖ ❖

W. L. ALLEN, chairman of the board of the Sheffield Steel Corpn., Kansas City, and director and member of the executive and finance committee of the American Rolling Mill Co., Middletown, Ohio, has resigned to engage in consulting work. Mr. Allen, who organized the Sheffield Steel Corpn., has had wide experience in operation, sales and financing of steel companies, and following the merger of that company with the American Rolling Mill Co., has spent considerable time in Europe in connection with its foreign activities.

❖ ❖ ❖

R. E. W. HARRISON, who has been identified with the Cincinnati Milling Machine Co. and Cincinnati Grinders, Inc., since 1923, has resigned as sales engineering director. Prior to 1923 he was with the Churchill Machine Tool Co., England, as assistant general works manager and later commercial manager. Mr. Harrison will continue as secretary and member of the executive committee of the machine shop practice division of the American Society of Mechanical Engineers.

❖ ❖ ❖

W. H. STEWART, who since 1923 has been vice-president of the Bethlehem Steel Export Corpn., in charge of the Bethlehem Steel Corpn.'s export business, has been elected president of the Pacific Coast Steel Corpn., Bethlehem's Pacific Coast subsidiary. He succeeds D. E. MCLAUGHLIN, who retired some months ago. S. M. BASH has been appointed vice-president of the export organization, succeeding Mr. Stewart. Mr. Bash has been an assistant to the vice-president in the export company.

❖ ❖ ❖

H. J. RITTER, assistant secretary and formerly sales engineer and manager of the New York sales office of the Norma-Hoffmann Bearings Corpn., Stamford, Conn., has been appointed sales manager.

❖ ❖ ❖

JOHN H. LOCKE, formerly manager of operations, General Steel Castings Corpn., Eddystone, Pa., has been elected a vice-president.

❖ ❖ ❖

WILLIAM A. IRVIN, president of the United States Steel Corpn., has been elected a director of the American Iron and Steel Institute to fill a vacancy in the class whose terms expire in 1933.

❖ ❖ ❖

F. C. BRABY, JOHN M. MACMILLAN and ANDREW WEST, of Frederick Braby & Co., Ltd., Glasgow, Scotland, manufacturer of sheet steel, have arrived in the United States and are making visits to American steel plants. Mr. Braby is a director of the company and a grandson of the founder. Mr. Macmillan is sales manager and Mr. West is connected with the engineering department.

❖ ❖ ❖

MEYER W. SINGER, for a number of years secretary of the Hausman & Wimmer Co., Pittsburgh, dealer in old materials, has established his own firm under the name of M. W. Singer & Co., with offices at 1704 Keenan Building, Pittsburgh, to deal in iron and steel scrap and old materials.

❖ ❖ ❖

MAJOR WILLIAM C. BLISS, superintendent, Scullin Steel Co., St. Louis, has been awarded the Order of the Purple Heart, originated by George Washington, but discontinued after three citations and reinstated this year with the Washington bicentennial celebration. Major Bliss, a reserve officer, was a captain in the Ordnance Department during the World War. The certificate was awarded "for especially meritorious service in charge of the transportation department of Intermediate Ordnance Depot No. 2 (Gievies, France)."

❖ ❖ ❖

J. S. TRITLE, vice-president and general manager of the Westinghouse Electric & Mfg. Co., East Pittsburgh, has been elected vice-president in charge of operations for the Westinghouse Electric Supply Co., wholesale distributor of Westinghouse products to electrical dealers, contractors and industrial establishments. He will continue in his recent position and assume his new duties immediately.

❖ ❖ ❖

GEN. OTTO H. FALK, for 20 years president, Allis-Chalmers Mfg. Co., Milwaukee, was elected chairman of the board of directors at the annual meeting held in New York on May 6.

MAX W. BABB, vice-president and general attorney, was elected president. It was stated officially following the meeting that the election of Gen. Falk to the office of chairman, vacant for several years, was at his request and in accordance with his desire to be relieved of some of the detail duties involved in the administration of his former office. He will continue his active connection with the company and supervision of its affairs.

WILLIAM A. THOMPSON, who was comptroller and secretary, and WILLIAM WATSON, general works manager, were elected vice-presidents. ARTHUR R. DILL, treasurer, and J. A. KEOGH, general auditor and assistant secretary, were elected secretary-treasurer and comptroller, respectively.

Mr. BABB became associated with the Allis-Chalmers Co., predecessor of the present corporation, in 1904, as attorney. He is a graduate of Wesleyan College, Mount Pleasant, Pa., and the University of Michigan. He was admitted to the bar in 1897 and practiced law at Mount Pleasant until going to Milwaukee. Mr. Babb is national counsellor for the Milwaukee Association of Commerce in the Chamber of Commerce of the United States, and a member of the national board of directors. He is also a director of the Federal Reserve Bank of Chicago, and a trustee of the Northwestern Mutual Life Insurance Co. of Milwaukee.

❖ ❖ ❖

O. E. LAECHELT, for the past five years with the Bunting Brass & Bronze Co., Toledo, has joined the sales department of the Detroit Seamless Steel Tubes Co., Detroit, and, will devote his efforts to the sale of the company's Detrolined steel-back bushings.

❖ ❖ ❖

D. S. MCDANNELL, JR., has been appointed director of purchases of Deere & Co., to fill the vacancy created by the death of Herbert G. Copp. The appointment was made by William Butterworth, chairman of the board. Mr. McDannell has been with Deere & Co. for 28 years, having served in various positions in the purchasing department.

❖ ❖ ❖

DONALD M. SCOTT has been elected vice-president and general manager of the Buffalo Electric Furnace Corpn., Buffalo, succeeding the late Sydney T. Wiles. Mr. Scott has been intimately in touch with the development of the hollow electrode furnace from its inception and since last October has been devoting his entire time to the business. He has been chairman of the engineering committee and as such has been virtually in charge of operations for several months.

❖ ❖ ❖

F. H. CHAPIN, president, National Acme Co., Cleveland, will sail May 13 for a trip to Europe. He expects to be away until about Aug. 1.

... OBITUARY ...

DONALD M. RYERSON

DONALD MITCHELL RYERSON, chairman of the board of Joseph T. Ryerson & Son, Inc., Chicago, died May 8 at his home at Lake Forest, Ill., aged 47. Because of ill health he had been inactive in the Ryerson company for many months, though retaining chairmanship of the board. He was educated at Yale and his scientific and industrial training was made available to the Government during the World War, when he supervised construction of submarine chasers at the Great Lakes Boat Building Corpn., Milwaukee. He was ordered to the Naval Academy at Annapolis in 1917 as a member of the first reserve officers' class, with the rank of ensign, and resigned after attaining the rank of lieutenant commander in overseas destroyer service. He was noted for evolving the "Four-Minute Man" campaign, which was instrumental in floating the Liberty Loans during the war. Mr. Ryerson was graduated from Yale University in 1907 and soon afterward entered the Ryerson company, which was founded in Chicago in 1842 by his grandfather, Joseph T. Ryerson. He was vice-president and general manager in 1928, when he succeeded his father, the late Edward L. Ryerson, Sr., as chairman of the board.

❖ ❖ ❖

SYDNEY T. WILES, vice-president and general manager of the Buffalo Electric Furnace Corpn., Buffalo, died of pneumonia on April 29. He was born in England 38 years ago and received his schooling at Highbridge Technical School, and at Sheffield University. Upon leaving the university, he was employed by Davy Brothers, Sheffield, until 1914, when he served in the war. After having been discharged for physical disability, he was engaged by Davy Brothers to supervise that company's military construction work in France and England. After the war he became a partner in Carlisle, Wiles & Co., consulting metallurgical engineers. From 1923 to 1929 Mr. Wiles was engaged as consultant by various Canadian companies. In 1928 Mr. Wiles conceived the fundamental idea involved in the hollow electrode furnace for the direct reduction of iron ore, described on page 1067 of this issue.

❖ ❖ ❖

CHARLES J. HARRAH, president of the Midvale Steel Co., Philadelphia, from 1890 until 1915, when it became a part of the Midvale Steel & Ordnance Co., then formed, died at a hospital at Cimiez, on the French Riviera, on April 30, aged 76 years. He had lived in France for 13 years. Mr. Harrah was born in Rio de Janeiro and received his schooling in Europe.

❖ ❖ ❖

CARL L. DORER, SR., president of the Dorer Foundry Co., Bellaire, Ohio, died at his home in that city on May 1, aged 80 years.

❖ ❖ ❖

COL. CAMERON C. SMITH, founder and formerly chairman of the board of the Union Steel Castings Co., Pittsburgh, died on May 1 while en route to Pittsburgh from his winter home in Eustis, Fla. He was born at Butler, Pa., in 1861, and was graduated from Waynesburg College, Waynesburg, Pa. He was first employed by the Carnegie Steel Co., Pittsburgh, but later became identified with the Reliance Steel Casting Co., Pittsburgh, which he served as assistant to the president. He organized the Union Steel Castings Co. in 1899, and had served as chairman of its board until his retirement a few years ago. He also served for a time as board chairman of the Pittsburgh Rolls Corpn., Pittsburgh, and was widely known in the roll and foundry business of the district. Mr. Smith was a member of the American Iron and Steel Institute, the American Society for Testing Materials, the American Society of Mechanical Engineers, the Engineers Society of Western Pennsylvania, and the Army Ordnance Association. He was also widely known in financial and civic enterprises in Pittsburgh, and had been a contributor to numerous national periodicals.

❖ ❖ ❖

H. L. HURD, retired mechanical engineer, who for a number of years had been associated with the American McKenna Process Co., Joliet, Ill., and the Midwest Box Container Co., Chicago, died May 4 at his home in Kenilworth, Ill. He was 52 years old.

❖ ❖ ❖

F. F. LANDIS, one of the founders of the Landis Tool Co., Waynesboro, Pa., died on May 2. With his brother, A. B. Landis, he started the manufacture of Landis grinders in 1889.

... LETTERS TO THE EDITOR ...

Where Lending Will Do the Most Good

Editor, The Iron Age:

YOUR article, "You Can Lead a Horse to Water," in the April 28, 1932, issue of THE IRON AGE finds me in a very receptive mood to your reasoning. So also have other articles which have appeared in your magazine from time to time, in which the banks have been taken to task for their extreme timidity at the present hour.

The day will come, and soon, when the bank officials of the country will realize that dividends on their stocks cannot be paid unless their money is out on interest. It is well enough to be fluid, but it is even better to be running a profitable business. A transition from their present position to one of less fluidity and more profit must be somewhere in sight, in order that the individual bank shall "balance its budget."

To start business there must be activity at the bottom of the commercial classification. Large industrial organizations, whether they make automobiles, cement, furniture, or any other article, cannot go into productivity without having orders in sight. And the ultimate user of all the materials which are manufactured and sold must be the small business man. That small business man is the backbone of the nation. If he, for any reason or other, stops business, the whole structure will stop. It has been a wonderful thing for this country that so many small business enterprises have been able, from one cause or another, to hold their heads above water during the period of depression which is now about to disappear. Most of these small business men or enterprises became involved in debt in order that their organizations might be maintained. It is the problems of this class which ought to be studied.

The small business man or enterprise has been told at the banks that he or it could not borrow money in view of the present conditions. A large majority of them have probably applied for loans on sundry occasions and have been denied them, only to be forced to finance themselves in some other way, by sacrificing property of substantial value or borrowing at exorbitant expense, viewed from the standard of normal times. A very great many of these small business men and enterprises have concluded not to make plans for renewed activity until the money market is freer.

If the banks are not disposed to lend to them, and they are not disposed to borrow, it is hard to see how the large organizations can prosper. When the banks are willing to lend, business will be delayed if at that time the small business man or enterprise is not prepared to take advantage of the changed conditions in the financial world. Is it not therefore time to urge upon this class the development of plans so that when the tide does turn there will be a speedy recovery of business?

William D. Shoemaker
Washington, D. C.

"Unemployment Insurance Would Help To Prevent Unemployment"

By E. F. DU BRUL

"UNEMPLOYMENT insurance would help to prevent unemployment as industrial compensation helps reduce accidents," Ernest Du Brul, former manager of the National Machine Tool Builders' Association, told members of the Ohio commission investigating unemployment insurance at Cincinnati the past week.

Mr. Du Brul would make unemployment insurance a compulsory cost to the employer, who could figure it in the selling price of his merchandise.

"Business will do nothing more after this depression than it has in the past, unless there is some compulsion," he continued.

"The plan of getting business men really interested in stabilization leaves me really uninterested," Mr. Du Brul said.

"Gerard Swope proposed to make 2500 trade associations into 2500 insurance companies insuring against five different kinds of risks. It was idealizing of trade associations as much as the parlor socialist idealized the workingmen he proposed to place at the head of an industry.

"Business men don't want to take the trouble to do things cooperatively. Many of them still believe in Santa Claus. There is little statistical work done, and what is done isn't used.

"Yet we live in a cooporative society. We have to invest our surplus in another business in the hope that it will be more stable or at least more profitable than our own. We are all tied up together economically as well as ethically.

"Bad ethics never has been good economics. As a capitalist, I fear excessive rugged individualism may destroy my capital by concentrating it in a few hands.

"It only takes 100 banks to control finances of this country. Excessive individualism may lead to public confiscation through legislation.

"We recognize the stewardship of wealth. We are not going to allow all the people to starve to death. You don't hear so much of unemployment insurance as a dole now.

"The practicability of it is a question of fact. If business would sit down and get the facts out of its own records, it could find out. The Geometric Tool Co. found that setting up of 2½ per cent reserve would have taken care of its employees."

Conference to Be Held on Small House Construction

The American Institute of Steel Construction is sponsoring a meeting to be held at the Engineering Societies Building, 29 West Thirty-ninth Street, New York, on Tuesday and Wednesday, May 24 and 25, to discuss plans for the building of small houses with modern materials. Questions to be considered include: Can the cottage be factoried and sold complete or in units to the owner? If the house is tailor-made, what materials make for better construction and what specifications offer the best chances of successful results? Builders and others who participate in the discussions will be asked to submit drawings, plans and exhibits.

A committee consisting of the following has been selected to analyze the various plans presented: D. Everett Waid, Metropolitan Life Insurance Co.; Fred T. Llewellyn, United States Steel Corpn.; Andrew J. Eken, Starrett Brothers & Eken, Inc.; H. H. Murdock, Jardine Murdock & Wright, architects; and Mrs. Christine Frederick, director, Applecroft Experiment Station.

Tuesday evening, May 24, a stainless steel symposium will be held to discuss stainless steel with special emphasis on its architectural uses. This meeting will be under the auspices of the New York section of the American Welding Society.

American Steel & Wire Co., which for many years has distributed its products in Chicago from a warehouse at 403 West Lake Street, is occupying a new warehouse at 2364 South Ashland Avenue.

•• EDITORIAL COMMENT ••

America First

IT recently became apparent, as pointed out editorially in THE IRON AGE a week ago, that political bickering at Washington was imperiling the success of the financial relief measures passed earlier in the year and of the vigorous open market policy recently adopted by the Federal Reserve banks. The strong reproof that the President gave Congress could not have been better timed. It voiced the sentiment of the nation; it was in no sense a "political" maneuver. It was in tune with the gravity of the economic situation, which demands that party advantage be forgotten in a united endeavor to minister to the imperative needs of the country at large.

The President spoke as the head of the nation, not as the leader of the Republican party. And there are convincing signs that members of Congress will now act as Americans and not as party members.

Certain things must be done and done expeditiously to save business from another severe crisis. First of all, muckraking must be sidetracked, however justified it may be. There will be plenty of time to investigate the causes of the depression and to fix the blame for reprehensible practices when the present emergency has passed. Secondly, the firing of political ammunition must be postponed until the Presidential campaigns get under way. The nation demands action from its legislators, not dialectics. Finally, Congress must concentrate on the task of balancing the budget. To achieve this end it must kill the bonus bill and other measures that would add to the Government's fiscal burdens; it must pass an adequate revenue bill; it must curtail Governmental costs.

Members of Congress will do well to take this responsibility seriously. Their constituents are aroused. When the present session has passed into history there will be no dodging the record. The electorate will know what to do with those who cannot forget party ties in a time of national danger; likewise it will know how to reward those who put America first.

• • •

Export Demand For Ingenuity

THE April volume of foreign orders for oil-burning furnace equipment set a new high mark for the industry according to reports of export trade organizations. Sales of oil burners during the first quarter of the year established a record and this demand mounted further in April. This is a most encouraging report in the midst of a monotony of dull export records. Inquiry into the cause develops the fact that the high record is chiefly due to the superiority of the American design and that here again ingenuity proves to be an asset which recognizes no economic trends.

The history of American industry is replete with similar records. In the early days of the textile machinery industry, the whole world turned to the comparatively few American manufacturers and exports ran high. Later other countries developed their own textile machinery and exports in this line dropped off. The same thing has been repeated many times with other products. This suggests that one way to maintain a good volume of exports independent of the relative cost of production is to have a product so much better in design that other countries will need it in spite of tariff walls and other obstacles.

The old slogan that "necessity is the mother of invention" should be put to work on an overtime schedule. New designs, new products, new and better ways of doing things: these are always in demand.

• • •

Larger Iron Yield From Ore

IRON ores used in the United States show fully one-fourth greater yield than ores used in the remainder of the world. Substantially complete iron ore statistics for 1930 have just become available. The ores showed lower yields all around than in 1929, presumably on account of variation in stocks, but combining the two years gives a close measure of how things run. World production of ore was about 199,000,000 tons in 1929 and 179,000,000 tons in 1930.

The United States produces rich ore and imports, chiefly from Chile, still richer ore. In 1929-30 the yield in pig iron and ferroalloys was 54.2 per cent, against 42.6 per cent for the remainder of the world, the United States running more than one-fourth (27 per cent) higher in yield. For the whole world the yield was 46.8 per cent. Chances are, moreover, that the rest of the world uses more scrap in blast furnace practice than does the United States.

World production of pig iron and ferroalloys was approximately 97,200,000 tons in 1929, 79,700,000 tons in 1930 and 55,400,000 tons in 1931. Our respective contributions do not show up well, having been 44 per cent in 1929, 40 per cent in 1930 and only 33 per cent in 1931.

Our proportion of the world's steel production, ingots and castings, experienced a similar decline, from about 47 per cent in 1929 to the neighborhood of 37 per cent in 1931.

We make more steel in proportion to pig iron than the rest of the world, averages for the last three years showing the United States producing 32 per cent more steel ingots and castings than pig iron, with only 12½ per cent excess for the remainder of the world. Excesses are due, of course, to the use of scrap, chiefly works scrap, in steel making. The real point is that the United States runs more to steel and less to iron castings than does the remainder of the world.

Steel Corporation Reduces Wages; Others Will Follow

Leading Producer Announces 15 Per Cent Cut Affecting Salaries Also as of May 16

A FURTHER reduction in wage and salary rates was announced on May 6 by the United States Steel Corpn. The statement was as follows:

"Effective May 16, the United States Steel Corpn. and subsidiary companies will reduce by approximately 15 per cent all wage and salary rates at all departments in the more important steel districts and in other locations to rates reflecting equitable differentials."

This reduction is the second made by the Steel Corporation during the present depression period, a 10 to 15 per cent decrease in salaries having been effected Aug. 15 and a 10 per cent wage cut having been declared Oct. 1, last year. In the past 30 years the Steel Corporation has reduced wages only five times and has increased wage rates on 18 occasions. Previous wage adjustments of the corporation, dating back to 1915, have been as follows:

Jan. 6, 1916, 10 per cent increase.
May 1, 1916, 10 per cent increase.
Dec. 15, 1916, 10 per cent increase.
May 1, 1917, 10 per cent increase.
Oct. 1, 1917, 10 per cent increase.
April 15, 1918, 10 per cent increase.
Aug. 1, 1918, 10 per cent increase.
Oct. 1, 1918, 8-hr. basic day adopted.
Feb. 1, 1920, 10 per cent increase.
May 16, 1921, 20 per cent decrease.
June 6, 1921, basic 8-hr. day abolished.
Aug. 29, 1921, decrease to 30c. per hr.
Sept. 1, 1922, 20 per cent increase.
April 16, 1923, 11 per cent increase.
Oct. 1, 1931, 10 per cent decrease.

The following table shows the wages of common labor after each advance or decrease in wages by the United States Steel Corpn.:

Date	Wages 10-Hr
1915	$2.00
Feb. 1, 1916	2.20
May 1, 1916	2.50
Dec. 15, 1916	2.75
May 1, 1917	3.00
Oct. 1, 1917	3.30
April 15, 1918	3.80
Aug. 1, 1918	4.20
Oct. 1, 1918	*4.62
Feb. 1, 1920	5.08
May 16, 1921	†4.05
July 16, 1921	†3.70
Aug. 29, 1921	3.00
Sept. 1, 1922	3.60
April 16, 1923	††4.00
Oct. 1, 1931	**3.60

*8-hr. basic day established and time and one-half paid for overtime.
**$3.60 for 8-hr. workers; $3.96 for 10-hr. workers.
†Approximated.
††$4.00 for 8-hr. workers; $4.40 for 10-hr. workers.

Although few of the independent steel companies have made official announcements, THE IRON AGE is informed by almost all of them that they will follow the lead of the Steel Corporation in making wage and salary reductions. The adjustments will not be in the same amount as that of the Steel Corporation in all cases. Some of the independent companies have only recently reduced salaries. The Gulf States Steel Co., Birmingham, has stated publicly that its reductions in wages and salaries will range from 10 to 25 per cent and will take effect from May 1. The average reduction will be 15 per cent, and those above that amount will affect only salaried employees.

Steel Institute Charges That Foreign Steel Is Being Dumped

Complaint Filed on Hoop, Band and Strip Steel with Treasury Department—Will Also Support Hawley Bill

WASHINGTON, May 10.—The domestic steel industry has launched a drive against imports of low-priced products. The move has two phases. One attack is through a complaint of dumping, so far confined to hoops and bands, but which may be expanded to cover other lines. The other step is through the Hawley bill to compensate for depreciated foreign currencies. Hearings on this measure will begin before the House Committee on Ways and Means on Thursday of the present week.

The complaint charging dumping of hoop, band and strip steel has been filed with the Bureau of Customs, Treasury Department, by Thomas J. Doherty, tariff counsel for the American Iron and Steel Institute. The complaint declares that heavy imports of hoop and band and strip steel are being made at Atlantic, Gulf and Pacific ports at delivered prices, including duty, at less than cost of production in the United States.

Belgium Chief Source

Belgium is shown as the chief source of these imports, with Germany, France and the United Kingdom following in the order named. The chief ports of entry are New York, Galveston and New Orleans. The laid-down prices at American ports are said to range from 1.29c. to 1.48c. per lb., which compare with the domestic price of 1.60c., Pittsburgh. It is claimed the foreign material can be laid down at Pittsburgh at 1.59c.

The complaint, referring to the imports, says: "Ample evidence will be produced of gross violations of the law to the very serious damage and detriment of the domestic steel industry."

The Hawley bill will be supported by the steel institute, Mr. Doherty said, as a means of protection against imports from countries off the gold standard. He said the institute may file a brief rather than present witnesses.

Concrete Bar Imports Increasing

Imports of reinforcing concrete bars are increasing while American production is declining, domestic interests declared yesterday at a hearing before Commissioner of Customs F. X. A. Eble. The proceeding related to the recent order of the Bureau of Customs requiring that foreign bars be marked to show countries of origin. Importers protested against the order and declared it was a part of a campaign to bar imports. American interests emphatically denied the charge and supported the order as being in line with the practice of domestic mills which mark bars. As such marking is done by American mills, it was urged that foreign bars should also be marked as required by the Tariff Act.

Scrap at Detroit Drops 25c to $1 a Ton

DETROIT, May 10.—The local scrap market has developed further weakness, with all items down 25c. to $1 a ton. The sharpest decline has been in blast furnace grades, for which there is practically no demand at the moment, shipments on contract to a local user having recently been completed.

Farval Corpn., 3277 East Eightieth Street, Cleveland, has acquired the manufacturing and sales rights of the Farval centralized system of lubrication, which was formerly manufactured by Lubrication Devices, Inc., Battle Creek, Mich. Distribution of Farval equipment for the central industrial section of the country is being handled by the Dingle-Clark Co., with offices in Cleveland, Cincinnati, Pittsburgh and Philadelphia.

Orders for steel boilers totaled 264 units with 372,782 sq. ft., against 204 with 244,927 sq. ft. in February, according to reports received by the Bureau of the Census from 72 manufacturers.

Steel Mills Take Firm Stand on Prices in Face of Wage Cuts

Price Structure Holding Well—Sheet Bars Advanced $2 a Ton for Third Quarter—Industry Formally Charges Foreign "Dumping"

IRREGULARITY still marks the course of steel business, mild improvement in some lines being offset by extreme dullness in others. The net result is that the industry as a whole has been barely able to maintain last week's ingot output rate of 24 per cent.

The automobile industry has failed to provide any important stimulus to steel production, but another purchase is expected next week from the Ford Motor Co., which, with other makers of low-price automobiles, is gradually expanding its output despite the paralyzing effect of present conditions on demand for higher-priced cars. Ford is increasing production more rapidly than some observers had believed possible and expects to reach 2800 a day by next week and 5000 a day by the end of the month. Chevrolet and Plymouth are also contributing to larger output in this branch of the industry. Together they produced 65 to 70 per cent of the estimated April total of 145,000 cars, and their share will be even greater of the 180,000 or more units that will be assembled this month.

THERE are no conspicuous railroad purchases except 10,000 tons of rails divided among three makers by the Great Northern, which will also order 3500 tons of track supplies.

Building construction gains lie more in the promise than in the performance. June 15 has been set as the date for receiving bids for 50,000 to 60,000 tons of plates for tunnel liners for the Hoover Dam. Two projects in the New York district, each of 13,000 tons, are about to be closed, one a post office extension in New York and the other grade separation work for the Long Island Railroad, which will soon inquire for 20,000 tons additional for similar construction.

There have been small increases in the demands from miscellaneous users for reinforcing bars, wire products, including mesh for road construction, and structural steel. Merchant bar orders have gained at Chicago, while some sheet and strip mills have better schedules, but business in these lines has not been evenly distributed. In the aggregate, steel tonnage has not gained much, if any, this month, and the decline of 145,487 tons in the unfilled orders of the United States Steel Corpn. is ample evidence of the general falling off in steel bookings in April.

A slight improvement at Chicago is reflected in the starting up of three additional open-hearth furnaces, but there has been a decline at Cleveland and at Buffalo, while other districts are merely maintaining last week's rate of ingot output. Although irregularities in production are bound to occur in a situation like the present one, the steel trade is inclined to the belief that such changes as may come during the next month or two will be generally on the side of improvement. However, no marked upturn can be foreseen for the near future.

MEANWHILE, steel companies are strengthening their position on prices to guard against the pressure that has already come from some directions as a result of the announcements of wage reductions. Makers of sheet bars have announced an advance of $2 a ton on this product, which will increase costs for non-integrated sheet and strip mills. Some of the sheet steel companies have been disposed to announce higher sheet prices for the coming quarter, but this move may be held in abeyance, if not abondoned entirely, and efforts may be concentrated on holding the present schedules, which thus far have withstood pressure for concessions. Many consumers are strongly in favor of price stabilization as a necessary factor in the improvement of their own position.

On behalf of the domestic steel industry, the American Iron and Steel Institute has filed charges with the Bureau of Customs, Treasury Department, alleging dumping of hoop, band and strip steel in the United States by Belgium, Germany, France and the United Kingdom. The complaint states that import prices are less than the cost of production in the United States. It is claimed that hoops and bands could be laid down at Pittsburgh, including duty and inland freight rate, at 1.59c. a lb., against a domestic price of 1.60c., Pittsburgh. Similar complaints may be filed respecting other steel products. Belgian mills have been the most aggressive sellers here, particularly since the imposition of steel tariffs by Great Britain. Owing to the loss of British trade, two Belgian mills may be forced to shut down, according to a cable dispatch from London to THE IRON AGE. English pig iron continues to come in, 5518 tons having arrived at Philadelphia last week.

Scrap prices are still declining in some centers, reductions of 25c. to $1 a ton having occurred at Detroit, while elsewhere the markets are extremely weak. There has been no further change, however, in heavy melting scrap, THE IRON AGE composite price for this grade remaining at $7.62 a ton. Pig iron is unchanged at $14.22 a ton and the finished steel average is 2.087c. a lb. for the seventh consecutive week.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	May 10, 1932	May 3, 1932	Apr. 12, 1932	May 12, 1931
Per Gross Ton:				
No. 2 fdy., Philadelphia	$14.84	$14.84	$15.59	$17.26
No. 2, Valley furnace	15.00	15.00	15.00	17.00
No. 2 Southern, Cin'ti	13.82	13.82	13.82	14.69
No. 2, Birmingham	11.00	11.00	11.00	12.00
No. 2 foundry, Chicago*	16.00	16.00	16.00	17.50
Basic, del'd eastern Pa.	16.00	16.00	16.00	17.00
Basic, Valley furnace	14.50	14.50	14.50	16.50
Valley Bessemer, del'd P'gh	17.39	17.39	17.39	18.76
Malleable, Chicago*	16.00	16.00	16.00	17.50
Malleable, Valley	15.50	15.50	15.50	17.00
L. S. charcoal, Chicago	23.17	23.17	23.17	25.04
Ferromanganese, seab'd carlots	†75.00	†75.00	†75.00	80.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Ferromanganese quotations adjusted to carload unit; larger quantities at discount.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	34.00	34.00	34.00	36.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	30.00
Sheet bars, Pittsburgh	26.00	26.00	26.00	30.00
Slabs, Pittsburgh	27.00	27.00	27.00	30.00
Forging billets, Pittsburgh	33.00	33.00	33.00	36.00
Wire rods, Pittsburgh	37.00	37.00	37.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.50	1.65

Finished Steel

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.65
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.65
Bars, New York	1.95	1.95	1.95	1.98
Tank plates, Pittsburgh	1.60	1.60	1.60	1.65
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	1.898	1.898	1.898	1.93
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.65
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.86775	1.86775	1.86775	1.90½
Cold-finished bars, Pittsburgh	2.00	2.00	2.00	2.10
Hot-rolled strips, Pittsburgh	1.40	1.40	1.40	1.55
Cold-rolled strips, Pittsburgh	2.00	2.00	2.00	2.15

Finished Steel

Per Lb. to Large Buyers:	May 10, 1932 Cents	May 3, 1932 Cents	Apr. 12, 1932 Cents	May 12, 1931 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.20	2.20	2.20	2.15
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.30	2.30	2.30	2.35
Sheets, galv., No. 24, P'gh	2.85	2.85	2.85	2.80
Sheets, galv., No. 24, Chicago dist. mill	2.95	2.95	2.95	2.90
Hot rolled sheets, No. 10, P'gh	1.55	1.55	1.55	1.70
Hot-rolled sheets, No. 10, Chicago dist. mill	1.65	1.65	1.65	1.80
Wire nails, Pittsburgh	1.95	1.95	1.95	1.90
Wire nails, Chicago dist. mill	2.00	2.00	2.00	1.95
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.25
Barbed wire, galv., Pittsburgh	2.60	2.60	2.60	2.55
Barbed wire, galv., Chicago dist. mill	2.65	2.65	2.65	2.60
Tin plate, 100 lb. Box, P'gh	$4.75	$4.75	$4.75	$5.00

Old Material

Per Gross Ton:				
Heavy melting steel, P'gh	$9.75	$9.75	$10.25	$11.25
Heavy melting steel, Phila	6.50	6.50	7.25	9.50
Heavy melting steel, Ch'go	6.62½	6.62½	7.12½	8.75
Carwheels, Chicago	6.50	6.50	7.00	8.75
Carwheels, Philadelphia	9.00	8.50	9.50	12.50
No. 1 cast, Pittsburgh	9.25	9.25	9.50	11.00
No. 1 cast, Philadelphia	8.50	8.50	9.50	11.50
No. 1 cast, Ch'go (net ton)	6.50	6.50	7.00	9.00
No. 1 RR. wrot., Phila	8.50	8.50	8.50	11.00
No. 1 RR. wrot., Ch'go (net)	4.25	4.25	5.50	7.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$2.25	$2.25	$2.25	$2.50
Foundry coke, prompt	3.00	3.50	3.50	3.50

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	5.75	5.87½	6.00	9.62½
Electrolytic copper, refinery	5.50	5.50	5.50	8.75
Tin (Straits), New York	20.65	20.40	18.50	23.12½
Zinc, East St. Louis	2.50	2.55	2.80	3.27½
Zinc, New York	2.87	2.92	3.17	3.62½
Lead, St. Louis	2.90	2.90	2.90	3.60
Lead, New York	3.00	3.00	3.00	3.75
Antimony (Asiatic), N. Y.	5.35	5.35	6.00	6.60

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

▲ ▲ ▲

▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
May 10, 1932	2.087c. a Lb.	$14.22 a Gross Ton	$7.62 a Gross Ton
One week ago	2.087c.	14.22	7.62
One month ago	2.087c.	14.35	8.21
One year ago	2.114c.	15.79	9.83
	Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1932	2.087c., Mar. 29;	2.037c., Jan. 19	$14.81, Jan. 5;	$14.22, May 3	$8.50, Jan. 12;	$7.62, May 3
1931	2.142c., Jan. 13;	2.052c., Dec. 29	15.90, Jan. 6;	14.79, Dec. 15	11.33, Jan. 6;	8.50, Dec. 29
1930	2.362c., Jan. 7;	2.121c., Dec. 9	18.21, Jan. 7;	15.90, Dec. 16	15.00, Feb. 18;	11.25, Dec. 9
1929	2.412c., April 2;	2.362c., Oct. 29	18.71, May 14;	18.21, Dec. 17	17.58, Jan. 29;	14.08, Dec. 3
1928	2.391c., Dec. 11;	2.314c., Jan. 3	18.59, Nov. 27;	17.04, July 24	16.50, Dec. 31;	13.08, July 2
1927	2.453c., Jan. 4;	2.293c., Oct. 25	19.71, Jan. 4;	17.54, Nov. 1	15.25, Jan. 11;	13.08, Nov. 22
1926	2.453c., Jan. 5;	2.403c., May 18	21.54, Jan. 5;	19.46, July 13	17.25, Jan. 5;	14.00, June 1
1925	2.560c., Jan. 6;	2.396c., Aug. 18	22.50, Jan. 13;	18.96, July 7	20.83, Jan. 13;	15.08, May 5

Pittsburgh Steel Demand Shows Mild Gains in Some Lines

PITTSBURGH, May 10. — Although some of the lines of finished steel made in this district are making a somewhat better showing than they were during April, aggregate demand has shown no definite change. However, no further contraction in steel orders or production has occurred except in the case of tin plate, which reflects a falling off for the second week. Fabricated structural steel awards are increasing and new inquiry is fairly well maintained. Reinforcing bars are also slightly more active. Orders from the automobile industry have brought about occasional gains in strip and sheet production, but schedules are still spotty, with some comparatively small makers benefiting much more than others. Demand for wire products is also a little stronger, having been benefited by the better movement of road mesh and manufacturers' wire. Pipe continues very quiet, and bars are slow to feel the impetus of improved demand from the automotive industry.

Steel ingot production in the Pittsburgh district is holding its own at about 20 per cent of capacity. Some of the smaller independent companies are maintaining a slightly higher rate. Valley mills reflect no noticeable improvement from last week, and the Wheeling district is maintaining the comparatively high level reached recently.

Finished steel prices are being watched very closely by both buyers and sellers following wage reductions announced by the steel industry last week. Although one or two buyers have already sought price reductions to be effective simultaneously with the wage decrease, the attitude of most steel users is more friendly toward the mills. In the meantime, quotations on the various forms of steel are being well maintained, and shipments against old low-priced contracts have been completed in the majority of cases. Further attempts to advance finished steel prices now seem to be out of the question, but all efforts will be made to hold the present set-up.

Mild gains have occurred in sales of sheets, strip, wire products and reinforcing bars, but aggregate tonnage is not definitely better.

* * *

Steel ingot production at Pittsburgh, Wheeling and in the Valleys has made no gains.

* * *

Finished steel prices being watched closely following announcements of wage reductions. A firm stand is being maintained by sellers.

Pig Iron

A large buyer of Bessemer iron in the Pittsburgh district is negotiating for its requirements over the ensuing year, but bids have not yet been taken. Both steel companies and merchant interests in this and nearby districts will probably quote on this tonnage. One or two small inquiries for foundry iron are before the trade, and purchases will probably clarify prices considerably. Current quotations are strictly nominal, but apply on carload business where competition from outside districts is not too much of a factor.

Semi-Finished Steel

No new buying is reported, but shipments this month are running a shade ahead of those of April. Prices are unchanged, being nominal at $26 to $27 a ton, Pittsburgh or Youngstown, for billets, slabs and sheet bars. Forging billets are more clearly defined at $33, Pittsburgh, with occasional small sales reported. Wire rods are holding at $37, Pittsburgh, but demand is light.

Rails and Track Supplies

Releases during the first 10 days of May were somewhat lower than they were in the corresponding April period. However, the carriers are erratic in their specifications, and are giving mills no opportunity to foresee the placing of tonnage. The local rail mill is not operating, and the district's track accessory capacity is engaged at about 25 per cent.

Bars, Plates and Shapes

The volume of fabricated structural steel awards is expanding more rapidly than it was a month ago. The number of small jobs of a seasonal character is gaining, and the placing of Government work is improving the backlogs of local fabricators. New inquiry is not up to the high level established during April, but is still accumulating with consistency. A local fabricator is low bidder for the bulkhead gates for the Hoover Dam, requiring 2500 tons of plates. No barge orders are reported, but several inquiries are quite active, and local builders expect to take some tonnage this week. Reinforcing bars are hardly as active as structural steel, as road work is not taking its usual quota. Nevertheless, small miscellaneous jobs make up a fair total of business each week. Merchant bars going to the manufacturing trade are still very quiet, and the volume of business in alloy steels is disappointing.

Makers are generally encouraged by the strength of prices, which is also being reflected in bids on fabricated structural steel and reinforcing bars. The 1.60c., Pittsburgh, price applies to the majority of tonnage now being booked, and shipments at lower figures are confined to jobs of long standing.

Cold-Finished Steel Bars

No material change has occurred in this market, although one or two makers report a limited increase in volume. The price is well maintained at 2c., Pittsburgh.

Tubular Goods

Pittsburgh mills expect the export order from the Irak Petroleum Corpn., which has been pending for several weeks, to be placed momentarily. The inquiry calls for 8400 tons of pipe. No other active line pipe projects are before the trade, although several are under consideration pending satisfactory financing. Oil country goods are still quiet, but a little buying is reported from time to time which gives promise of additional activity in the Mid-continent fields. Comparatively speaking, standard pipe is the dullest item in the tubular goods line, as this should be the most active season for this material. Mechanical tubing is moving in light but steady volume, and some business in boiler tubes is being taken. Pipe operations are not above 15 per cent of capacity.

Wire Products

Slightly heavier releases of manufacturers' wire from the automotive industry, together with increased inquiry for road mesh, have given the wire market a slightly better tone in the last week. Aggregate tonnage reaching mills has gained a little, although the merchant trade is still ordering material very sparingly. Prices are being maintained very effectively, with manufacturers' wire quoted at 2.20c., Pittsburgh, and nails at $1.95 a keg.

Sheets

Automobile sheets still constitute the major portion of current demand. Further purchases by the Ford Motor Co. are in prospect for next week. Furniture sheets are particularly quiet, although there is still a fair movement of electric refrigerator stock. Tack plate also continues to make a good showing, but other sheet consuming industries have not increased their requirements. Operations remain under the 25 per cent mark, most of the time, although improved schedules in Detroit and Ohio River mills have boosted the average for the industry in the last week.

Sheet prices are still well held, considering the lightness of demand, and one or two makers are considering advances for third quarter. In view of the recent wage cut by the leading companies, there is a belief in some quarters that further strict maintenance of the present levels should be the principal objective.

Tin Plate

Reduced specifications since the first of the month are affecting mill schedules more noticeably, and production for the industry as a whole is not over 45 per cent this week. The larger container manufacturers are specifying sparingly, and will apparently await more definite crop reports before ordering out material. In the mean time, the credit position of many of their customers is still a subject for apprehension. Stocks of tin plate in producers' warehouses are larger than might be expected at this time of the year.

Strip Steel

Improvement is scarcely noticeable in this line, although automobile tonnage is benefiting several companies. The placing of further orders by such consumers seems likely within the next week. Mill schedules are very uncertain, with most producers attempting to maintain a few turns every other week. The production rate on hot-rolled material is under 20 per cent, and cold-rolling mills are hardly engaged so well. Prices are standing the test on such business as has been placed recently.

Coke and Coal

The coke market has scarcely any bright spots, with shipments to foundries particularly discouraging. The furnace grade is even more quiet, and most of the large buyers are not operating their stacks. Furnace coke is nominally quotable at $2.25, Connellsville, while prices on the foundry grade range from $3 to $4.50 a ton, depending on quality. Slack prices have eased off following a week or two of advances brought about by labor difficulties at eastern Ohio mines.

Old Material

Inconsequential purchases of both heavy melting steel and hydraulic compressed sheets in the last week have established recent quotations on these grades of scrap, but substantial buying by mills is still lacking. Record low prices are heard in connection with the sale of the last Pennsylvania Railroad list, and it is believed that the heavy melting steel involved brought less than $10. Quotations on the uncut scrap in the list were also well under recent levels. Dealers are still having difficulty finding shipping points for the scrap they have coming out and are unwilling to build up yard stocks further. The market is consequently rather weak on most all grades. No demand for blast furnace scrap is in evidence, and only one shipping point is open.

Valley Mill Schedules Show No Further Improvements

YOUNGSTOWN, May 10.—Finished steel releases in the Valleys have shown little change in the new month. Shipments of sheets and strip steel to the automobile industry have increased slightly because of orders placed late in April by the Ford Motor Co., and the current schedules of the other two principal makers of low-priced cars are being maintained at a sufficient rate to aid steel shipments. Nevertheless, bar releases by the automotive industry continue to be rather disappointing, and the production schedules of Valley makers show little change.

Other finished steel products manufactured by Youngstown mills are still dormant. Demand for pipe, although encouraged by improved conditions in the oil industry, has shown no appreciable change. Large line pipe orders and inquiries are lacking, although feeder lines requiring up to 1000 tons of steel involve a fair total. Standard pipe is exceedingly quiet, and movement of oil country goods shows no change. Movement of tin plate has slackened a little, although increased specifications at this time of the year might be expected. Makers believe that current dullness may be offset by more urgent demand later as definite crop reports in the next 30 days will undoubtedly bring out heavier releases from the large container makers. Demand for wire products fails to show much change. Road building activity has developed a better movement of road mesh, and culvert stock has shown seasonal gains in recent weeks.

Steel ingot production in the Valleys is still holding the gains registered in the last two weeks, but the current requirements of finishing mills are barely sufficient to maintain it. The larger independent companies are running their steel plants at 20 per cent or less, but the schedules of the Carnegie Steel Co. are high enough to increase the general average by at least five points. One of these plants is supplying sheet bars to tin plate and sheet mills in the vicinity, and is thus serving the most active finished lines. Tin plate production averages from 45 to 50 per cent, and sheet mills in the district as a whole are holding at about 25 per cent. Schedules of the remaining finished steel units in the district range downward from the sheet level, and amount to scarcely 10 per cent on pipe.

The finished steel price structure remains generally satisfactory. Shipments on low-priced business taken during the first quarter have been completed in most instances, and consumers are beginning to specify against contracts at current levels. However, some of them have never made commitments at the higher figures and are merely placing spot orders for their immediate requirements. Sheet and strip quotations have shown the greatest comparative improvement, as they were most demoralized when price stabilization was undertaken in the second quarter. Nevertheless, bars are well established at 1.60c., Pittsburgh, and 1.65c., Cleveland, reflecting an increase of $2 a ton. Semi-finished steel quotations are also more regular, with $26, Youngstown, the minimum figure on all new business in billets, slabs and sheet bars.

The pig iron market is still very dull, and prices are largely nominal. Scrap is also weak, but shipments are being received at several points and the market is not clogged up with distress material.

New England Pig Iron Market Has Poor Week

BOSTON, May 10.—The slight improvement noted in pig iron buying a week ago has not continued, sales the past week dropping to approximately 700 tons, of which the Mystic Iron Works sold 500 tons, all in small lots. The market is devoid of inquiries. Domestic iron prices are holding despite low quotations made on Dutch iron.

Scrap

Brokers are doing little or no business, and foundries are buying almost nothing from local or nearby yards. Some of the large New England consumers of scrap have been offered material at very attractive prices, but are not in the market at any price. In the absence of business there is no opportunity for scrap prices to change.

Chicago Steel Ingot Production Is Increased Slightly

▲ ▲ ▲

CHICAGO, May 10.—The local iron and steel market, though still sluggish, shows a few signs of added life. Specifications and new buying of finished steel are holding to the gains made a week ago and this added business is reflected in ingot output, three open-hearth furnaces having been added. Production is a shade above 20 per cent of capacity.

Prices, as would be expected, are under pressure because of recent wage reductions, but sellers are trying to counteract this move by insisting that present levels will hold, but that thoughts of advances for the third quarter are being laid aside.

Dealers in pig iron are taking a firmer stand at $16 a ton, local furnace, but sellers of scrap are attempting to underbid one another in a market that is noted for its absence of buyers.

An encouraging factor is a slow spreading of bar consumption among miscellaneous users. Warehouses also find that the number of orders is slowly creeping upward. Rail releases are slightly larger, thereby permitting a moderate growth in the rate of rolling. On the whole, the foundation of the market is firmer, but there is nothing in sight now that foretells a marked turn upward.

Steel specifications and sales holding recent minor gains. Ingot output increased slightly.

* * *

Sellers holding firmly to current prices, but may abandon idea of advance for third quarter.

* * *

Pig iron sellers taking firm price stand at $16, but scrap prices are still very weak.

▼ ▼ ▼

Pig Iron

Sellers of Northern foundry iron are taking a firmer stand at $16 a ton, local furnace. New buying is in small lots and releases so far in May do not show up better than the average in April. The two active merchant stacks are operating with very slow blast, and stocks on hand, including those on docks, are slowly shrinking. Although stocks are large there is some difficulty in matching specifications.

Bolts, Nuts and Rivets

Specifications in May are running lighter than those of April. Jobbers are still accepting shipments against specifications entered before recent price changes.

Plates

A small pipe order has been taken by the Milwaukee maker and there are several new light tonnage orders in prospect. The aggregate of the steel needed is small, and therefore plate mills will not obtain from this source the volume needed to bring their output in line with that of mills making other heavy tonnage products. It is reported that the railroads, in looking for further economies, may first come into the market for locomotives rather than for cars. Reports from oil producing countries indicate fair activity in well drilling, but stagnation in new plant development.

Structural Material

In the absence of fresh inquiries, local fabricators are studying over old projects, but find little in the way of encouragement. It is true that several private projects of good size are still open, but there is usually a trade in bonds in the deal and neither contractors nor fabricators are in position to do business in that way. The Dakotas are planning rather extensive bridge work and Minnesota is taking a similar step. Work for fabricators is more plentiful in the near Northwest than it is in any other sector around Chicago.

Reinforcing Bars

Prices in this market are nominal in the absence of buying except a few small tonnages for road work. The market for rail steel bars for roads has settled to 1.55c. a lb. Shipments to road contractors are growing steadily, but new lettings are slow in being signed. Illinois is to open one more set of bids in the near future.

Cast Iron Pipe

New buying is in extremely light volume, but fresh inquiries are encouraging, though no large tonnages are making their appearance. Foundries are trying to group orders to facilitate production schedules and in so doing are slowing deliveries except on those orders that can move from well-rounded foundry stocks. Prices are variable under the influence of keen competition.

Rails and Track Supplies

The Great Northern has ordered 10,000 tons of rails, about equal tonnages going to the Illinois, Inland and Bethlehem mills. This railroad still has 3500 tons of track supplies to purchase. Inquiries are dull, but mills are getting more liberal releases, which permit a small increase in the rate of production. Many Western railroads are calling men back for track work.

Wire Products

Business is slowly improving in wire products as dealers are more active in rounding out stocks. Some business has come to mills from the Detroit area, which promises even larger tonnages in the near future. Improvement is noted in jobbers' activity in Texas and in the near Northwest. Larger quantities of reinforcing mesh are moving from mills, and this condition promises to become better as the month advances. Output is between 25 and 30 per cent of capacity.

Sheets

Demand is sluggish, and some roiling units did not start before the middle of the week. Container manufacturers are only moderately busy, and downspout and gutter makers are finding this one of the slowest spring seasons in many years. Production is at close to 20 per cent of capacity.

Bars

A moderate but steady expansion is noted in orders for miscellaneous users of bar mill products. Releases from automobile manufacturing centers are steady. Sellers of iron bars are dropping prices $1 a ton to 1.65c. a lb., Chicago.

Scrap

Dealers in this market remain bearish, and some tonnages are being offered below current quotations. Consumption is light, and there are no sales by which true price levels can be gaged. Heavy melting steel is moving on dealer trades at $6.25 a gross ton, but railroad offerings bring higher prices. The Illinois Central, which sent out a list, has withdrawn its offering. Mills are permitting slightly larger shipments of heavy melting steel.

Eastern Pennsylvania Mills Subsisting on Small Orders

Operations Still Average About 15 Per Cent—Pig Iron Demand Also Confined to Pick-Up Lots

PHILADELPHIA, May 10.—The market continues to be listless. While there was a slight bulge in operations last week owing to a moderate increase in specifications, the rate of output is again about 15 per cent of capacity. Orders that are being placed are often of an emergency character, denoting a scarcity of supplies in the hands of users.

Pig Iron

The market remains dull. It is reported that efforts to resell foreign tonnage have proved unsuccessful, despite price concessions. Another shipment of English iron, amounting to 5518 tons, arrived in this port last week for delivery to a cast iron pipe foundry on the Delaware River. Domestic shipments are few and cover only carlots. Prices quoted are $14 to $14.50, base furnace, on foundry grades generally, though $15 has not disappeared on very small lots.

Sheets

The market here shows no response whatever to automotive requirements. No important business from that source has been placed with makers in this district. Light as they have been, operations of body building plants have been reduced further. It is the hope, however, that the Ford Motor Co.'s activities will soon increase and spread to mills and body builders in this district.

Plates, Shapes and Bars

The second quarter is proceeding with light demand. The price structure, however, is apparently holding well and buyer resistance is reported to be almost entirely absent. Fabricators are figuring on a great deal of work, much of it being Federal projects.

Warehouse Business

Demands on jobbers are extremely light. Swedish round bars have declined 1c. per lb. to 5.60c.

Imports

English pig iron predominated in last week's imports at Philadelphia, 5518 tons having come from that country and 452 tons from British India. There were no steel imports.

Scrap

While prices have softened further in several grades, quotations on low phosphorus and cast iron carwheels have moved up 50c. Moderate sales of these grades have given a slightly firmer tone to them. Heavy melting steel has been sold at $6, delivered, on a short-haul transaction and at an increase of 50c. over this level on a fair movement involving a longer haul.

Pacific Coast Outlook Improved By Large Construction Projects

SAN FRANCISCO, May 9.—Specific projects on which bids are soon to be taken are the largest in the aggregate that have come up on the Pacific Coast in more than eight months, and the outlook is greatly improved thereby. June 15 has been set as the date for the opening of bids at Denver on tunnel lines for the Hoover Dam, which will require between 50,000 and 60,000 tons of plates. The Six Companies, Inc., contractor for the Hoover Dam, will require 3000 to 4000 tons of piling and cableways during the next few months. The Federal Bureau of Reclamation has opened bids at Denver on more than 1800 tons of steel for bulkheads and gates for Hoover Dam. The Independent Bridge Co. was low on the major item. To complete the San Francisco Hetch Hetchy water system, for which bonds of $6,500,000 were voted on May 3, about 2000 tons of steel will be required for pipe line, siphon and tunnel structures. Awards of structural steel and reinforcing bars the past week totaled 2700 tons.

Mills have advanced Pacific Coast delivered prices on plates $1 a ton, from 1.85c. a lb. to 1.90c. Hot-rolled annealed sheets have been advanced from 2.30c. a lb. to 2.32½c. On all commodities except reinforcing bars, light shapes and wire products, the market is fairly firm and slightly more active.

Indicative of current prices for reinforcing steel in southern California were two public awards last week. The city purchasing agent of Los Angeles covered open requirements for the Bureau of Power and Light at 1.80c. out of a local distributer's stock, and the Water Department of Long Beach received a quotation of 1.65c. for 76 tons of ⅜ to ¾-in. bars delivered to a local pumping plant.

Pig Iron and Steel Prices Firm at St. Louis

ST. LOUIS, May 10.—Orders for carloads comprise about the only pig iron business placed during the week by melters in this district. All orders are for rush shipment, melters being without reserve stocks. Foundry operations are at low ebb. Pig iron prices are firm and unchanged.

Open-hearth operations were increased by the addition of two furnaces that were down for about 10 days, operations now being at about 11 per cent of capacity.

Despite light business in plates, shapes and bars, prices continue firm.

The Missouri Highway Commission will open bids Thursday for projects requiring approximately 1000 tons of reinforcing bars and 750 tons of structural steel.

The scrap market is at a standstill. Consumers are not buying, and neither are dealers, who have no orders on their books. Prices are nominal. Iron car axles are $1 a ton lower. Railroad lists: Illinois Central, 3000 tons; Wabash, 770 tons; Kansas City Southern, 160 tons; Chicago, Milwaukee, St. Paul & Pacific, 62 carloads; New York, Chicago & St. Louis, 21 carloads; Chicago, Rock Island & Pacific, 20 carloads. Missouri Pacific, which has issued no written list since Feb. 29, is expected to issue a list this week of probably 100 carloads.

Cincinnati Pig Iron Demand Slackens

CINCINNATI, May 10.—Further slackening in the pig iron demand was noted the past week, when bookings did not exceed 600 tons. Buying for immediate use is the only business. Inquiry is confined to single car lots.

Steel

Failure of automobile manufacturers to sustain specifications brought a slackening in sheet business the past week. Production this week has been reduced to about 30 per cent of capacity.

Cleveland Steel Demand Is Not Gaining, Production Lower

Ingot Output Rate for District Declines to 26 Per Cent—Sheet Bars Advanced $2 for Third Quarter

CLEVELAND, May 10.—The volume of business in finished steel shows no upward trend. The only demand is for small lots, with the aggregate tonnage running about the same as in April. Steel ingot production in Cleveland declined three points to 26 per cent of capacity this week. Finishing mill operations are irregular. One local plant cleaned up on its orders today and probably will be shut down the remainder of the week.

There is very little new tonnage coming from the motor car industry, although some of the Ohio sheet mills are still operating on recent orders from that source. Production of automobiles outside of the lower-priced class is slack, and this is being reflected in the business of parts makers in the northern Ohio territory. Demand for steel from other sources shows little life. No business is coming from the railroads in this territory, and there is little activity in the building field.

Consumers of Lake Superior ore having long-term contracts are making allotments for their 1932 requirements, which are sharply restricted. While prices for the season have not been named, it is now rather generally understood that last year's prices will be reestablished. A price reduction, it is pointed out, would be a disturbing factor in the steel market, and consumers do not seem inclined to favor lower prices, as a reduction would necessitate a writing down of the inventories of their present large ore stocks.

Makers of sheet bars have announced a $2 a ton price advance for the third quarter and, should this be maintained, it may result in the marking up of sheet prices for that delivery. Prices on finished steel products generally are firm. While there is weakness in fabricated steel prices, producers appear to be holding to the established prices for structural shapes.

Pig Iron

Sales and inquiries fell off the past week. One local interest sold 2000 tons in small lots. Shipments so far this month have been in about the same volume as during April. While there has been a slight gain in the demand from some other sources, most of the iron is going to the motor car industry. Conditions with jobbing foundries continue quiet. The only sizable inquiry is from an Ohio foundry for 500 tons. Prices are unchanged and untested. Foundry and malleable iron are quoted at $15.50, furnace, for local delivery and $15 for nearby shipment, with lower prices for shipment to competitive points.

Semi-Finished Steel

A $2 a ton advance on sheet bars to $28, Cleveland and Youngstown, for the third quarter has been announced by leading makers. These feel that they should get better prices for their product and their evident purpose in naming the higher price so far in advance of the quarter is to serve notice on buyers before they start to sell sheets that they will have to pay more for their raw material.

Iron Ore

No inquiries have come out and prices for the season have not been named. Shipments from Lake Erie docks during April were 203,280 tons, against 355,448 tons during the same month last year. The dock balance May 1 was 5,517,051 tons, against 5,429,721 tons on the same date a year ago.

Sheets

Demand is slow and most orders are only for small lots. Little new business is reported from stamping plants in this territory making automobile parts. Electrical sheets are moving fairly well. Demand from makers of washing machines, as well as from manufacturers of electric refrigerators, has declined. Grave vault makers have been affected by the general situation. The local Fisher Body plant is maintaining its recently increased production schedules and is taking good shipments. Black sheets are well established at 2.20c., at which some fair orders were taken the past week. Other prices are well maintained.

Strip Steel

New business is very light, although fair releases for hot-rolled strip are coming from some of the leading makers of automobile accessories. Hot-rolled strip is firm at 1.40c., Pittsburgh, for narrow and 1.50c. for wide material, and most producers are adhering to $2 a ton higher prices for less than car lots. Cold-rolled strip is firm at 2c., Cleveland.

Bars, Plates and Shapes

Activity in these products continues light. As forge shops in this territory are getting little automobile business, there is not much demand for bars from that source. A highway bridge at Niles, Ohio, will take 450 tons of reinforcing bars. Other inquiry for bars for construction work is light. Demand for structural steel is confined mostly to small lots. Prices are firm at 1.65c., Cleveland, for bars and 1.60c., Pittsburgh, for plates and shapes.

Old Material

The only activity is a limited amount of small-lot buying by dealers. Prices have declined 25c. a ton on some steel-making grades and 50c. a ton on blast furnace grades. Shipments to consumers are very light.

Birmingham Market on Routine Basis

BIRMINGHAM, May 10.—Shipments of pig iron during the first week of May held close to the April rate. Some of the tonnage now being shipped has been carried on the books of local furnaces since as far back as 1930. Current buying is a continuation of small, spot orders. Quotations for the Southern market are steady at $11. The spring season has been poor for local pipe manufacturers, and the immediate outlook is not encouraging. Present pipe plant operations are under 25 per cent and plant schedules fluctuate from week to week. Base quotations of $32 to $33 for pipe have been unchanged for some time. Furnace operations still consist of seven active stacks, the same as for the past three weeks. Three furnaces are on basic, two on foundry, one on recarburizing and one on high silicon iron.

Steel

Last week brought the usual run of routine business to local steel manufacturers. A wire manufacturer reports a slight improvement in new tonnage booked last week. Orders for structural steel and reinforcing bars are still mostly of small size. Virginia Bridge & Iron Co. is starting shipments this week on the 1000-ton order for the Montgomery Post Office, previously reported.

The open-hearth plant of the Gulf States Steel Co. resumed operations on May 6 with two units. This plant had been idle since April 11. The schedule for the present week also calls for two units to operate. The Tennessee company continues with four open-hearths at Fairfield and five at Ensley.

American Rolling Mill Co. reports a net loss for the first quarter of $571,917 after depreciation, interest and taxes. The company's loss in the first quarter of .1931 was $663,049.

Structural Steel Most Active Line in New York Market

Two Projects, Each of 13,000 Tons, at Point of Closing—Additional 20,000 Tons to Be Needed by Long Island Railroad

NEW YORK, May 10.—Two large structural steel projects in this district, which are on the point of being closed, constitute the major part of prospective business. These jobs are the General Post Office extension in New York and grade elimination work for the Long Island Railroad at Valley Stream, L. I., each of which will take 13,000 tons. The Long Island Railroad will soon come into the market for about 20,000 tons of steel for further grade elimination work along its right of way. Another structural steel project is 2500 tons for a highway bridge for the State of New Jersey on route 36 over the Shrewsbury River between the Highlands and Seabright.

Aside from structural steel, the market in this district is extremely dull, there being few orders and few prospects for orders. Steel companies are maintaining a firm stand on prices, their attitude having been strengthened by the expectation that some buyers will seek concessions as a result of the announcements of wage reductions.

Pig Iron

A Connecticut melter is in the market for 250 tons of foundry iron for delivery to its Bridgeport plant, and American Locomotive Co. requires 100 tons for prompt shipment to its Schenectady works. These two inquiries represent the bulk of pending business. Sales last week, totaling 1500 tons, compare with a like quantity the week before and 2500 tons two weeks ago. A tonnage of iron is being offered for resale by a concern which has closed its New Jersey foundry. Prices are unchanged.

Reinforcing Bars

Specifications for bars are improving. Road construction work in Westchester County requires about 385 tons, and two State highway bridges in New Jersey will take about 800 tons. Private building projects, however, are still scarce. The current base of 1.60c., Pittsburgh, or 1.95c., delivered New York, is fairly well established, although no real test has been provided in the prolonged absence of important demand.

Scrap

An almost total absence of demand has further demoralized prices. Stove plate is notably weak, owing to the recent withdrawal from the market of the principal user of this grade. No. 1 heavy melting steel is obtainable at $4.50 to $4.75, on barge.

Buffalo Steel Output Lower; One Mill Idle

BUFFALO, May 10.—The American Locomotive Co. has an inquiry out for 100 tons of foundry for Schenectady. A Connecticut melter seeks 250 tons of foundry. Producers note some improvement, one characterizing it as "a definite slowing up of the decline."

Steel

Bethlehem Steel continues to operate nine open-hearths at its Lackawanna plant, and it is probable that this operation will continue throughout the month. The Republic plant is idle this week. A Buffalo fabricator of structural steel has taken a State bridge at Albany calling for 200 tons. It will also fabricate a 350-ton bridge for Thomaston, Conn. Automobile sheet business is being placed in fair volume.

Scrap

There has been an influx of barge shipments from New York City. It is reported that the principal consumer is not at present buying hydraulic compressed sheets in Detroit. Stock piles are large, with one melter reported to have at least 125,000 tons on hand.

Reinforcing Steel

Awards 1650 Tons—New Projects 4300 Tons

AWARDS

Gloucester, Mass., 150 tons, post office to Kalman Steel Co.

Moline, Ill., 225 tons, water plant, to Republic Steel Corpn.

Kaukauna, Wis., 160 tons, sluice gates, to an unnamed bidder.

Stockton, Cal., 500 tons, waterfront development, to Concrete Engineering Co.

Oakland, Cal., 150 tons, foundations for El Dorado Oil Co. plant, to Truscon Steel Co.

Pomona, Cal., 463 tons, County fair grandstand, to Blue Diamond Corpn, Ltd.

NEW REINFORCING BAR PROJECTS

Pittsfield, Mass., 100 tons, State road.

Westchester County, N. Y., 385 tons, Bronx River Parkway extension; bids May 23.

Monmouth County, N. J., 472 tons, State highway bridge over Shrewsbury River between Highlands and Seabright; bids May 25.

State of New Jersey, 337 tons, bridge over Beach Thoroughfare at Ninth Street, Ocean City; bids May 18.

Manistee, Mich., 200 tons, highway bridge.

Niles, Ohio, 450 tons, highway bridge.

Toledo, Ohio, 100 tons, foundations for Toledo Terminal Railroad bridge.

Danville, Ill., 100 tons, Veterans' Bureau building; H. B. Ryan Co., general contractor.

Waukegan, Ill., 125 tons, post office, Paschen Brothers, Chicago, low bidders.

Jefferson City, Mo., 1000 tons, highway projects; bids opened May 12.

Seattle, 185 tons, University of Washington law school; bids closed May 9.

San Francisco, 723 tons, structures for water system tunnels; bids close June 6.

Jefferson, Ore., 315 tons, Santiam River highway bridge; bids close May 18.

Pipe Lines

Gulf Coast Pipe Line Co., Esperson Building, Houston, Tex., has awarded about 175 tons of fabricated steel pipe to Wyatt Metal & Boiler Works, Washington Street, for new natural gas line.

Pacific States Gas & Electric Co., San Francisco, will soon begin construction of a welded steel pipe line from Milpitas, Cal., through San Mateo County, connecting present line from San Joaquin Valley and Kettleman Hills district with points on coast, about 40 miles, to cost close to $1,500,000.

Surburban Utilities Co., 4401 South Peoria Street, Tulsa, Okla., representing consolidation of three natural gas utilities, is planning several extensions in system during next 90 days, comprising 8-in. and 2-in. steel lines.

H. A. Shellenberger, Muskogee, Okla., and associates have secured natural gas franchise at Talihina, Okla., and plan installation of pipe line distributing system.

Cast Iron Pipe

Arlington, Mass., has placed its 1932 requirements with Warren Foundry & Pipe Corpn., including 12,000 ft. of 6- and 8-in. for immediate use.

Hawthorne, N. Y., awarded 2000 tons to United States Pipe & Foundry Co.

Latham's Corners, N. Y., is in the market for 200 tons of small sizes.

Brentwood, N. Y., awarded 285 tons of 3- to 30-in. to Warren Foundry & Pipe Corpn.

Wingdale, N. Y., awarded 486 tons of 3- to 24-in. to Warren Foundry & Pipe Corpn.

Morristown, N. J., has taken bids on 500 tons of 4- to 12-in.

Toledo, Ohio, is in the market for 2200 ft. of 6- to 24-in.

Monroe, Mich., will purchase 5000 ft. of 6- to 12-in.

St. Louis will buy 8400 ft. of 36-in.

Railroad Equipment

Alaska Railroad has ordered 10 50-ton hopper ballast cars from General American Tank Car Corpn.

Union Tank Car Co., Inc., ordered five tank car tanks from Graver Tank & Mfg. Corpn.

Cudahy Packing Co. ordered 25 sets of freight car underframe parts from Pullman Car & Mfg. Corpn.

Hill & Seunder, Inc., placed an order for nine heavy-duty air dump cars with Koppel Industrial Car & Equipment Co.

Norfolk & Western has authorized application of steel roofs for 500 40-ton box cars, work to be done at its Roanoke shops.

Bethlehem Steel Co., Bethlehem, Pa., is distributing reprints of an article by C. H. H. Weikel, its industrial agent, on "The Economics of Plant Location," copies of which can be obtained upon request.

Fabricated Structural Steel

Awards Second Lowest This Year—New Inquiries Higher

TOTAL lettings of 5650 tons were the smallest since the second week of February. The largest bookings were 1000 tons for a post office at Montgomery, Ala., and 1000 tons for a bridge at Chippewa Falls, Wis. Bridge awards call for more than 2500 tons. New projects of 11,025 tons compare with 5025 tons a week ago. A bridge across the Shrewsbury River between Highlands and Seabright, N. J., and a cableway for the Hoover Dam will each require 2500 tons. Inquiries for bridge work total 5900 tons. Awards follow:

NORTH ATLANTIC STATES

Thomaston, Conn., 350 tons, bridge, to Lackawanna Steel Construction Corpn.

Albany, N. Y., 220 tons, State highway bridge, to Lackawanna Steel Construction Corpn.

New York, 105 tons, crane runway extension for New York Navy Yard, to National Bridge Co.

New York, 675 tons, Knickerbocker apartment building, to Lehigh Structural Steel Co.

Erie County, N. Y., 115 tons, State highway bridge, to F. L. Heughes & Co.

Quakertown, Pa., 210 tons, addition to power house, to Lehigh Structural Steel Co.

THE SOUTH

Daytona Beach, Fla., 190 tons, S. H. Kress store, to Virginia Bridge & Iron Co.

Montgomery, Ala., 1000 tons, post office, to Virginia Bridge & Iron Co.

CENTRAL STATES

Chippewa Falls, Wis., 1000 tons, State highway bridge, to Worden-Allen Co.

Kaukauna, Wis., 100 tons, for United States engineer, to Pittsburgh-Des Moines Steel Co.

Chicago, 110 tons, Goodyear hangar, to Austin Co.

Lakeside, Ohio, 105 tons, auditorium roof, to Fort Pitt Bridge Works Co.

WESTERN STATES

Goldbar, Wash., 450 tons, Skykomish River bridge, to Hofius Steel & Equipment Co.

Van Nuys, Cal., 225 tons, City Hall, to McClintic-Marshall Corpn.

Stockton, Cal., 600 tons, waterfront development, to Pacific Coast Engineering Co.

Southern Pacific Co., 441 tons, bridges, to Virginia Bridge & Iron Co.; previously reported as 245 tons.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Newark, N. J., 5500 tons, post office and court house; N. R. Severin Co., low bidder on general contract.

New York, 13,000 tons, general post office extension; James Stewart & Co., Inc., low bidder on general contract.

Long Island Railroad, 12,000 tons, grade crossing elimination at Valley Stream; Foley Brothers, Inc., low bidder on general contract.

State of New Jersey, 2500 tons, highway bridge across Shrewsbury River, route 36, between Highlands and Seabright; bids May 25.

State of New Jersey, 600 tons, bridge over Beach Thoroughfare at Ninth Street, Ocean City; bids May 18.

Washington, 500 tons, Science building for Georgetown University.

CENTRAL STATES

Jefferson City, Mo., 750 tons, highway projects, bids opened May 12.

Crawfordsville, Ind., 100 tons, building for Donnelly Brothers.

Fort Wayne, Ind., 500 tons, boiler house.

Toledo, Ohio, 150 tons, bridge for Toledo Terminal Railroad.

WESTERN STATES

Pueblo, Colo., 100 tons, State highway structures; bids close May 12.

Hoover Dam, 1000 tons, piling for Six Companies, Inc., contractor.

Hoover Dam, 2500 tons, cableway for Six Companies, Inc.

Hoover Dam, 2500 tons, bulk head gates; Independent Bridge Co. low bidder.

Hoover Dam, 500 tons, stony gates; Lakeside Bridge & Steel Co., Milwaukee, low bidder.

State of Washington, 750 tons, highway bridge at Silvania.

Snohomish Co., Wash., 200 tons, Skykomish River highway bridge; bids close May 15.

King County, Wash., 600 tons, Green River highway bridge.

Stockton, Cal., 260 tons, Garwood Ferry County bridge, bids close May 23.

Vernon, Cal., 400 tons, municipal power station; bids close May 23.

Sacramento, Cal., 721 tons, H Street County bridge; bids close May 19.

Los Angeles, 170 tons, Hawthorne Avenue substation; Kyle Steel Construction Co. and McClintic-Marshall Corpn, low on alternates.

San Francisco, 223 tons, structures for water system tunnels; bids close June 6.

FABRICATED PLATE

AWARDS

Pittsburgh, 1000 tons, six barges for American Barge Lines, to American Bridge Co.

St. Louis, 425 tons, pontoons for United States Engineer, to St. Louis Structural Steel Co.

Vernon, Cal., 400 tons, waste boilers, to Consolidated Steel Co.

NEW PROJECTS

San Francisco, 1300 tons, pipe line and siphon to complete Hetch Hetchy water system.

Los Angeles, 900 tons, gas holder for Southern Counties Gas Co.

Seens to Succeed Perley as Canadian Steel Head

Ward B. Perley, president, Canadian Steel Corpn., Ltd., Ojibway, Ont., will retire July 1 under the United States Steel Corpn. pension plan and will be succeeded by J. W. Seens, president, Canadian Bridge Co., Ltd., Walkerville, Ont., who will also continue in the latter position.

Mr. Perley has been president of the Canadian Steel Corpn. since September, 1927, when he was elected to that position to succeed the late Elbert H. Gary. For 11 years prior to that time Mr. Perley was vice-president and general manager of the Canadian company.

He has had wide experience in iron and steel works operation. In the 1880's he was connected with the Franklin Iron Works Co., operating a blast furnace at Columbus, Ohio, and later he was in charge of various operations for King, Gilbert & Warner. In 1899, when the National Steel Co. was acquired by the King, Gilbert & Warner Co., Mr. Perley went to Chicago as assistant to Riley Gilbert, vice-president in charge of the operating department. In 1901 he became connected with the New York offices of the United States Steel Corpn. For five years before going to Ojibway, Mr. Perley was assistant to President James A. Farrell of the Steel Corporation in New York. When he was placed in charge of the Canadian enterprise it was expected that blast furnaces and steel works would be built at Ojibway, but this project was held in abeyance. However, certain finishing departments were installed, including plants for the manufacture of wire and wire products, galvanized sheets and tin plate.

WARD B. PERLEY

Sheet Steel Direct From Molten Metal

Several years ago C. W. Hazelett of Cleveland invented and developed the Hazelett process for the production of sheet lead direct from the molten metal. In the past few months this process has been successfully applied to the production of sheet steel in a large plant in Ohio. The application of this process to sheet steel has been worked out by Mr. Hazelett and the indications are, according to advices to THE IRON AGE, that a decided step forward has been made in this branch of the steel industry. Up to the present time the sheets produced have been in the narrower widths, but negotiations are under way for placing in operation a 42-in. sheet mill.

Copper Tariff Proposal Fails to Aid Market; Tin and Zinc Decline

NEW YORK, May 10.—The principal development of interest to the copper trade in the past week was the action of the Senate Finance Committee in reversing its previous decision by including a proposed duty of 4c. a lb. on import copper, with a proper compensatory rate to be determined later. Opinion in the trade as to eventual disposition of the tariff, however, is about evenly divided. Notwithstanding the interest aroused by the committee's action, domestic demand is virtually stagnant. Current transactions are restricted to car lots. Electrolytic copper is still quotable at 5.75c., delivered Connecticut Valley, with 5.62½c. having been named in one or two instances for quick shipment. Export bookings yesterday of 430 tons reflected a slightly improved foreign demand, but export sales of only 1700 tons thus far in May are disappointing. Copper Exporters, Inc., continues to maintain an official price of 6.25c., but most foreign sales are being booked at 6c. Lake copper is dull and nominally lower at 5.75c., delivered.

Lead

Although a fairly steady flow of sales was maintained throughout the past week, the volume declined somewhat from that in the preceding week. Recent transactions involved metal principally for delivery in May, about 75 per cent of consumer requirements now being covered for that month. Further buying for June shipment is in early prospect, with only 40 per cent of consumer needs booked for next month. Prices are firm at 2.90c. a lb., St. Louis, and 3c., New York.

Tin

The New York price of tin, in sympathy with sharp declines yesterday and today in the London market, dropped today to 20.65c. a lb. The weakness in the London market was apparently due to selling pressure occasioned by lack of assurance that the two-month suspension of operations, recommended by the Tin Producers Association, will be effected. Details covering the proposed curtailment are still vague, and further developments are not likely to ensue until the next meeting of the International Tin Committee late in May. Tin buying here has not been stimulated by the possibility of further curtailment; in fact, there was evidence last week that consumers were trying to resell metal at the 22c. level. Today's London quotations were £120 a ton for spot standard, £122 for future standard and £124 for spot Straits. The Singapore market today was £127 5s. Shipments from the East in the first week in May were 1207 tons. United Kingdom warehouse stocks increased 10 tons last week to 33,231 tons.

Zinc

Sluggish consumer demand and slowly accumulating producer stocks tended largely to depress the price of zinc last week to a new low level of 2.50c. a lb., East St. Louis, and 2.87c., New York. If zinc consumption does not gain in volume in the next two months, drastic curtailment in production is considered inevitable for the summer months. The daily output of slab zinc in April was 688 tons, compared with 726 tons in March, according to American Bureau of Metal Statistics. Stocks in April increased 2574 tons.

▲ ▲ ▲

The Week's Prices. Cents Per Pound for Early Delivery

	May 4	May 5	May 6	May 7	May 9	May 10
Lake copper, New York	5.75	5.75	5.75	5.75	5.75	5.75
Electrolytic copper, N. Y.*	5.50	5.50	5.50	5.50	5.50	5.50
Straits tin, spot, N. Y.	22.00	22.10	21.95	...	20.95	20.65
Zinc, East St. Louis	2.50	2.50	2.50	2.50	2.50	2.50
Zinc, New York	2.87	2.87	2.87	2.87	2.87	2.87
Lead St. Louis	2.90	2.90	2.90	2.90	2.90	2.90
Lead, New York	3.00	3.00	3.00	3.00	3.00	3.00

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel, electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 5.35c. a lb., New York.
Brass ingots, 85-5-5-5, 6.12½c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	22.00c. to 23.00c.
Tin, bar	24.00c. to 26.00c.
Copper, Lake	8.00c. to 9.00c.
Copper, electrolytic	7.75c. to 8.75c.
Copper, casting	7.50c. to 8.50c.
*Copper sheets, hot-rolled	15.37½c.
*High brass sheets	12.50c.
*Seamless brass tubes	15.75c.
*Seamless copper tubes	14.87½c.
*Brass rods	10.25c.
*Brazed brass tubes	21.62½c.
Zinc, slab	4.00c. to 4.50c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig	4.00c. to 4.50c.
Lead, bar	5.75c. to 6.75c.
Lead sheets	7.50c.
Antimony, Asiatic	8.50c. to 9.50c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent.	17.00c. to 18.00c.
Solder, ½ and ½	14.75c. to 15.75c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	25.00c.
Tin, bar	27.00c.
Copper, Lake	6.75c. to 7.00c.
Copper, electrolytic	6.75c. to 7.00c.
Copper, Casting	6.50c. to 6.75c.
Zinc, slab	4.25c. to 4.50c.
Lead, American pig	3.75c. to 4.00c.
Lead, bar	7.25c.
Antimony, Asiatic	10.00c.
Babbitt metal, medium grade	14.50c.
Babbitt metal, high grade	29.00c.
Solder, ½ an ½	16.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	4.25c.	5.00c.
Copper, hvy. and wire	4.00c.	4.75c.
Copper, light and bottoms	3.25c.	4.00c.
Brass, heavy	2.25c.	2.75c.
Brass, light	1.75c.	2.50c.
Hvy. machine composition	3.25c.	3.75c.
No. 1 yel. brass turnings	2.25c.	2.75c.
No. 1 red brass or compos. turnings	2.75c.	3.25c.
Lead, heavy	2.00c.	2.50c.
Zinc	1.00c.	1.625c.
Cast aluminum	3.50c.	4.75c.
Sheet aluminum	8.00c.	9.50c.

Unfilled Steel Tonnage Declines 145,487 Tons

The thirteenth consecutive decline in the unfilled tonnage of the United States Steel Corpn., reported at noon on Tuesday, occurred as of April 30. The drop amounted to 145,487 tons, bringing the April 30 figure down to 2,326,926 tons, a new low record.

Unfilled orders at the end of each month since 1929 follow:

	1932 Tons	1931 Tons	1930 Tons
January	2,648,150	4,132,351	4,468,710
February	2,545,629	3,965,194	4,479,748
March	2,472,413	3,995,330	4,571,653
April	2,326,926	3,897,729	4,354,220
May	.....	3,620,452	4,059,227
June	.....	3,479,323	3,968,064
July	.....	3,407,816	4,022,055
August	.....	3,169,457	3,580,204
September	.....	3,144,833	3,424,338
October	.....	3,119,432	3,481,763
November	.....	2,933,891	3,639,636
December	.....	2,735,353	3,943,596

Cooper Alloy Foundry Co., Elizabeth, N. J., has broadened the scope of its operations to include production of low chrome and chrome-nickel steels for high tensile and pressure castings. These alloys include standard specifications as well as special analyses to meet specific requirements.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.91c.
Del'd New York	1.95c.
Del'd Detroit	1.80c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c.
C.i.f. Pacific ports	2.00c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft.	1.60c.
F.o.b. Birmingham, mill lengths	1.75c.
F.o.b. Cleveland	1.50c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.30c. to 1.35c.
F.o.b. Chicago Heights mills	1.50c. to 1.60c.
Del'd Philadelphia	1.49c. to 1.59c.

Iron

Common iron, f.o.b. Chicago	1.65c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.11c.
Common iron, del'd New York	2.15c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7935c.
F.o.b. Coatesville	1.70c.
F.o.b. Sparrows Point	1.70c.
F.o.b. Lackawanna	1.70c.
Del'd New York	1.898c.
C.i.f. Pacific ports	1.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.6495c.
Del'd New York	1.86775c.
C.i.f. Pacific ports (standard)	2.00c.
C.i.f. Pacific ports (wide flange)	2.10c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago mill	2.05c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
2000 (½% Nickel)	$0.25
2100 (1½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2600 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3450 Nickel Chromium	3.20
4100 Chromuim Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
6100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flats)	0.25
Rounds and squares	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Cold-Finished Bars

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.00c.
Bars, f.o.b. Chicago	2.00c.
Bars, Cleveland	1.90c. to 2.00c.
Bars, Buffalo	2.00c.
Shafting, ground, f.o.b. mill	*2.35c. to 3.30c.

*According to size.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot-rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.55c.
No. 10, f.o.b. Chicago mill	1.65c.
No. 10, del'd Philadelphia	1.86c.
No. 10, f.o.b. Birmingham	1.70c.
No. 10, c.i.f. Pacific Coast ports	2.32½c.

Hot-Rolled and Annealed

No. 10, Pittsburgh	1.70c.
No. 10, Chicago mills	1.80c.
No. 10, Birmingham	1.85c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.20c.
No. 24, f.o.b. Chicago mills	2.30c.
No. 24, del'd Philadelphia	2.46c. to 2.51c.
No. 24, f.o.b. Birmingham	2.35c. to 2.50c.
No. 24, c.i.f. Pacific Coast ports	2.85c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.25c.
No. 10 gage, f.o.b. Chicago mills	2.35c.
No. 10 gage, del'd Philadelphia	2.46c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.75c.
No. 20 gage, f.o.b. Chicago mills	2.85c.
No. 20 gage, del'd Philadelphia	3.06c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	2.90c.

Steel Furniture Sheets

No. 10, f.o.b. Pittsburgh	2.65c.
No. 20, f.o.b. Pittsburgh	3.15c.

(Prices on furniture stock include stretcher leveling but not resquaring.)

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Chicago mills	2.95c.
No. 24, del'd Philadelphia	3.16c.
No. 24, f.o.b. Birmingham	3.00c.
No. 24, c.i.f. Pacific Coast ports	3.50c.

Long Ternes

No. 24, unassorted, 8-lb coating, f.o.b. P'gh	2.80c. to 3.00c.

Vitreous Enameling Stock

No. 10 f.o.b. Pittsburgh	2.60c.
No. 20, f.o.b. Pittsburgh	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.40c. to 2.50c.
No. 28, Chicago mill	2.50c. to 2.60c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mills	$4.75
Standard cokes, f.o.b. Gary	4.85

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$9.50
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.10
30-lb. coating I.C.	14.90
40-lb. coating I.C.	16.70

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, Pittsburgh	1.50c. to 1.60c.
Wider than 6 in., P'gh	1.40c. to 1.50c.
6 in. and narrower, Chicago	1.60c. to 1.70c.
Wider than 6 in., Chicago	1.50c. to 1.60c.
Cooperage stock, P'gh	1.60c. to 1.70c.
Cooperage stock, Chicago	1.70c. to 1.80c.

Cold-Rolled Strips

F.o.b. Pittsburgh	2.00c.
F.o.b. Cleveland	2.00c.
Del'd Chicago	2.30c.
F.o.b. Worcester	2.20c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	2.90c. to 3.00c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

(After Dec. 31, extras of 10c. a 100 lb. on mixed and joint carloads, 25c. on pool carloads and 40c. on less than carloads will be applied on all merchant wire products.)

To Manufacturing Trade

Bright wire	2.20c.
Spring wire	3.20c.

To Jobbing Trade

	Base per Keg
Standard wire nails	$1.95
Smooth coated nails	1.95
Galvanized nails	3.95

	Base per Lb.
Smooth annealed wire	2.35c.
Smooth galvanized wire	2.80c.
Polished staples	2.50c.
Galvanized staples	2.75c.
Barbed wire, galvanized	2.60c.
Woven wire fence, No. 9 gage, per net ton	$55.00
Woven wire fence, No. 12½ gage and lighter, per net ton	60.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

STEEL PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	47	21½	¼ and ⅜ + 9		+ 3½
¼ to ⅜	53	27½	½	25	7
½	58	44½	¾	30	13
¾	62	50½	1 and 1¼	33	17
1 to 3	64	52½	1½ and 2	37	20

Lap Weld

2	57	45½	2	25	11
2½ to 6	61	49½	2½ to 3½	30	15
7 and 8	58	45½	4 to 6	32	19
9 and 10	56	43½	7 and 8	31	18
11 and 12	55	42½	9 to 12	28	13

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜ + 11		+ 46
¼ to ⅜	49	32½	½	25	9
½	55	44½	¾	30	14
¾	60	49½	1 to 2	36	20
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	31	15
2½ to 4	59	48½	2½ to 4	36	22
4½ to 6	58	47½	4½ to 6	35	21
7 to 8	54	41½	7 and 8	33	19
9 and 10	47	34½	9 to 12	23	10
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2½%, and on galvanized by 1½ points with supplementary discounts of 5 and 2½%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3½ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold-Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2½ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	34.00
Light (from rail steel), f.o.b. mill	32.00

Track Equipment

	Base per 100 Lb.
Spikes, 9/16-in. and larger	$3.60
Spikes, ½-in. and larger	3.60
Spikes, boat and barge	3.80
Tie plate, steel	1.85
Angle bars	2.75
Track bolts, to steam railroads	3.50
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	75
†Carriage bolts	75
Lag bolts	75
Plow bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagons	75
C.p.c. and t. square or hex. nuts, blank or tapped	75
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	75
Semi-finished hexagon castellated nuts, S.A.E.	75
Stove bolts in packages, P'gh	77½, 25 and 10
Stove bolts in packages, Ch'go	77½, 25 and 10
Stove bolts in pkgs., Cleveland	77½, 25 and 10
Stove bolts in bulk, P'gh	86
Stove bolts in bulk, Chicago	86
Stove bolts in bulk, Cleveland	86
Tire bolts	60 and 10

Discount of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.25
F.o.b. Chicago	70, 10 and 5

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread	85 and 10 to 85, 10, 10 and 10
Upset set screws	80, 10 and 5
Milled studs	70

SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$26.00 to $27.00
Rerolling, 4-in. and under 10-in., Youngstown	26.00 to 27.00
Rerolling, 4-in. and under 10-in., Cleveland	26.00
Rerolling, 4-in. and under 10-in., Chicago	29.00
Forging quality, Pittsburgh	33.00 to 34.00
Forging quality, Youngstown	33.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$26.00 to $27.00
Youngstown	26.00 to 27.00
Cleveland	26.00

(Turn to next page)

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$37.00
Cleveland	37.00
Chicago	38.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.25
Foundry, f.o.b. Connellsville prompt	$3.00 to 4.50
Foundry, by-product, Chicago ovens	7.50
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd	8.35 to 8.75
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	7.82
Foundry, Birmingham	5.00
Foundry, by-products, St. Louis, f.o.b., ovens	8.00
Foundry, by-products, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.50
Mine run coking, coal, f.o.b. W. Pa.	1.50 to 1.60
Gas real, ¾-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	0.65 to 0.80
Gas slack, f.o.b. W. Pa. mines	0.65 to 0.80

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	3.50c.
No. 4 industrial	3.25c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	2.75c.
No. 5 industrial fuel oil	2.60c.

Per Gal. f.o.b. Cleveland

No. 3 industrial fuel oil	4.62½c.
No. 4 distillate	3.87½c.

REFRACTORIES

Fire Clay Brick

	Per 1000 High-heat Duty Brick	f.o.b. Works Intermediate Duty Brick
Penn.	$38.00	$25.00 to $30.00
Maryland	38.00	25.00 to 30.00
New Jer.	$44.00 to 57.00	
Ohio	38.00	25.00 to 30.00
Kentucky	38.00	25.00 to 30.00
Missouri	35.00	30.00
Illinois	38.00	25.00 to 30.00
Ground fire clay, per ton	6.50	

Chrome Brick

	Per Net Ton
Standard size	$42.50

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$38.00
Chicago	47.00
Birmingham	50.00
Silica clay, per ton	8.0

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$61.50
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	38.50
Domestic, f.o.b. Chewelah, Wash.	20.00

CAST IRON PIPE

Per Net Ton

6-in. and larger, del'd Chicago	$36.40 to $38.40
4-in., del'd Chicago	39.40 to 41.40
6-in. and larger, del'd New York	28.20
4-in., del'd New York	31.20
6-in. and larger, Birm'ham	$32.00 to 33.00
4-in., Birmingham	35.00 to 36.00

Class "A" and gas pipe, $3 extra.

Pig Iron, Ores, Ferroalloys

VALLEY

Per gross ton, f.o.b. Valley furnace:

Basic	$14.50
Bessemer	15.50
Gray forge	15.00
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.50
Low phos., copper free	25.00

Freight rate to Pittsburgh or Cleveland district, $1.89.

PITTSBURGH

Per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$15.00
No. 2 foundry	16.00
No. 3 foundry	15.50
Malleable	16.00
Bessemer	16.00

Freight rates to points in Pittsburgh district range from 69c. to $1.26.

CHICAGO

Per gross ton at Chicago furnace:

N'th'n No. 2 fdy.	$16.00
N'th'n No. 1 fdy.	16.50
Malleable, not over 2.25 sil.	16.00
High phosphorus	16.00
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	16.14
Low phos., sil. 1 to 2, copper free	27.50
Silvery, sil. 8 per cent	23.67
Bess. ferrosil'n, 15 per cent	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
Northern No. 2 fdy., del'd St. Louis	$18.30 to 18.80
Southern No. 2 fdy. del'd.	14.56
Northern malleable, del'd.	18.30 to 18.80
Northern basic, deliv'd	18.30 to 18.80

Freight rates 83c. (average) Granite City to St. Louis; $2.30 from Chicago; $4.56 from Birmingham.

NEW YORK

Per gross ton, delivered New York district:

*Buffalo, No. 2, del'd east. N. J.	$17.91 to $18.41
East. Pa. No. 2 fdy.	15.52 to 15.77
East. Pa. No. 2X fdy.	16.02 to 16.27

Freight rates: $1.32 to $2.63 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of $3.41 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:

No. 2 fdy.	$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.25	16.50
Basic	15.50
Lake Superior charcoal, del'd	23.41

NEW ENGLAND

Per gross ton delivered to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.54 to $20.04
*Buffalo, sil. 2.25 to 2.75	$19.54 to $20.04
*Ala., sil. 1.75 to 2.25	19.74
*Ala., sil. 2.25 to 2.75	20.24
†Ala., sil. 1.75 to 2.25	15.88
†Ala., sil. 2.25 to 2.75	16.28

Freight rates: $5.04 all rail from Buffalo; $9.75 all rail from Alabama and $5.88 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

CINCINNATI

Per gross ton, delivered Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$13.82
Ala. fdy., sil. 2.25 to 2.75	14.32
Tenn. fdy., sil. 1.75 to 2.25	13.82
N'th'n No. 2 foundry	$17.01 to 17.59
S'th'n Ohio silvery, 8%	21.02

Freight rates, $2.02 from Ironton and Jackson, Ohio; $3.82 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:

East. Pa. No. 2	$14.84 to $15.34
East. Pa. No. 2X	15.34 to 15.84
East. Pa. No. 1X	15.84 to 16.34
Basic del'd east. Pa.	16.00
Malleable	18.00 to 18.50
Stand. low phos. (f.o.b. east. Pa. furnace)	22.00 to 23.00
Cop. b'r'g low phos. (f.o.b. furnace)	22.00 to 22.50
Va. No. 2 plain	22.04
Va. No. 2X	22.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 84c. to $1.79 from eastern Pennsylvania furnaces; $4.67 from Virginia furnaces.

CLEVELAND

Per gross ton at Cleveland furnace:

N'th'n No. 2 fdy. (local delivery)	$15.50
S'th'n fdy., sil. 1.75 to 2.25	16.14
Malleable (local delivery)	15.50
Ohio silvery, 8 per cent	21.87
Stand. low. phos., Valley	25.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 55c. average local switching charge; $3.12 from Jackson, Ohio; $6.14 from Birmingham.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$11.00
No. 2 soft, 2.25 to 2.75 sil.	11.50
Basic	11.00

CANADA

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	$23.00 to 23.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	*$72.00 to $75.00
Foreign, 80%, Atlantic or Gulf port, duty paid	*72.00 to 75.00

*Minimum price quoted for lots of 2000 tons or more.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$26.00 to $27.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$77.50
50% (less carloads)	85.00
75% (carloads)	126.00
75% (less carloads)	136.00
14% to 16% (f.o.b. Welland, Ont., in carloads)	31.00
14% to 16% (less carloads)	36.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$20.50	14%	$23.50
11%	21.00	15%	24.00
12%	21.50	16%	25.00
13%	22.50	17%	26.50

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$18.00	12%	$20.50
7%	18.50	13%	21.50
8%	18.75	14%	22.50
9%	19.00	15%	23.00
10%	19.50	16%	24.00
11%	20.00	17%	25.50

Other Ferroalloys

Ferrotungsten, per lb. wo. del., carloads	$1.08
Ferrotungsten, less carloads	$1.1[illegible] to 1.25
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	14.00c.
Ferrochromium, 2% carbon	17.00c. to 17.50c.
Ferrochromium, 1% carbon	19.00c. to 19.50c.
Ferrochromium, 0.10% carbon	23.50c. to 25.00c.
Ferrochromium, 0.06% carbon	25.50c. to 27.00c.
Ferrovanadium, del., per lb. contained Va.	$3.[illegible] to $3.25
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	100.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., basis, per gross ton	85.00
Ferromolybdenum, per lb. Mo., del.	90c.
Calcium molybdate, per lb. Mo. del.	80c.
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton	$113.50
Silico spiegel, per ton, f.o.b. furnace, car lots	32.50
Ton lots or less, per ton	37.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	105.00
1% carbon grade	115.00
Spot prices	$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.50
Old range non-Bessemer, 51.50% iron	4.35
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c. to 8.50c.
Iron, low phos., Swedish, average 68½ iron	9.00c.
Iron, basic or foundry, Swedish, average 65% iron	8.00c.
Iron, basic and foundry, Russian, aver. 63% iron (nom.)	9.00c.
Manganese, Caucasian, washed 52%	24.00c.
Manganese, African, Indian, 50-52%	23c. to 24c.
Manganese, Brazilian, 46 to 48%	21c. to 22c.

	Per Gross Ton
Tungsten, Chinese wolframite	$10.75 to $11.00
Tungsten, domestic scheelite	$10.00 to 10.50
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic seaboard	18.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic seaboard	20.00

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, Kentucky and Illinois mines, freight allowed, Pittsburgh basis	$20.[illegible]
No. 2 lump, 85-5, Kentucky and Illinois mines, freight allowed, Pittsburgh basis	22.[illegible]
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	$17.00 to 17.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	22.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$9.50 to $10.00
No. 2 heavy melting steel	8.00 to 8.50
No. 2 railroad wrought	9.50 to 10.00
Scrap rails	9.50 to 10.00
Rails 3 ft. and under	11.00 to 11.50
Sheet bar crops, ordinary	9.50 to 10.00
Compressed sheet steel	9.25 to 9.75
Hand bundled sheet steel	8.00 to 8.50
Hvy. steel axle turnings	8.00 to 8.50
Machine shop turnings	6.50 to 7.00
Short shov. steel turnings	6.50 to 7.00
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron carwheels	9.75 to 10.25
Heavy breakable cast	8.00 to 8.50
No. 1 cast	9.00 to 9.50
Railr. knuckles and couplers	10.00 to 10.50
Rail. coil and leaf springs	10.00 to 10.50
Rolled steel wheels	10.00 to 10.50
Low phos. billet crops	12.50 to 13.00
Low phos. sheet bar crops	11.50 to 12.00
Low phos. plate scrap	10.50 to 11.00
Low phos. punchings	10.50 to 11.00
Steel car axles	14.00 to 15.00

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$6.50 to $6.75
Shoveling steel	6.50 to 6.75
Frogs, switches and guards	6.50 to 6.75
Hydraulic comp. sheets	5.25 to 5.75
Drop forge flashings	4.75 to 5.25
No. 1 busheling	4.75 to 5.25
Rolled carwheels	7.25 to 7.75
Railroad tires	8.50 to 9.00
Railroad leaf springs	8.00 to 8.50
Axle turnings	5.00 to 5.50
Steel couplers and knuckles	7.00 to 7.50
Coil springs	8.50 to 9.00
Axle turnings (elec. furn.)	5.50 to 6.00
Low phos. punchings	8.00 to 8.50
Low phos. plates, 12 in. and under	7.50 to 8.00
Cast iron borings	3.25 to 3.75
Short shoveling turnings	3.25 to 3.75
Machine shop turnings	2.75 to 3.25
Rerolling rails	8.50 to 9.00
Steel rails, less than 3 ft.	8.00 to 8.50
Steel rails, less than 2 ft.	8.50 to 9.00
Angle bars steel	7.50 to 8.00
Cast iron carwheels	6.50 to 7.00
Railroad malleable	6.25 to 6.75
Agricultural malleable	5.75 to 6.25
*Relaying rails, 56 to 60 lb.	15.00 to 17.00
*Relay rails, 65 lb. and up	18.00 to 20.00

	Per Net Ton
Iron angle and splice bars	$5.75 to $6.25
Iron arch bars, transoms	5.50 to 6.00
Iron car axles	11.50 to 12.00
Steel car axles	8.25 to 8.75
No. 1 railroad wrought	4.25 to 4.75
No. 2 railroad wrought	5.75 to 6.00
No. 1 busheling	4.25 to 4.75

No. 2 busheling	$2.00 to	$2.50
Locomotive tires, smooth	7.50 to	8.50
Tires and flues	2.50 to	3.00
No. 1 machinery cast	6.50 to	7.00
Clean automobile cast	6.25 to	6.75
No. 1 railroad cast	6.00 to	6.50
No. 1 agricultural cast	5.25 to	5.75
Stove plate	4.75 to	5.25
Grate bars	5.25 to	5.75
Brake shoes	6.00 to	6.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$6.00 to	$7.00
No. 2 heavy melting steel		5.00
No. 1 railroad wrought	7.00 to	7.50
Bundled sheets	4.50 to	5.00
Hydraulic compressed, new	5.00 to	5.50
Hydraulic compressed, old	4.50 to	5.00
Machine shop turnings	3.50 to	4.00
Heavy axle turnings	6.00 to	6.50
Cast borings (nom.)	3.00 to	3.50
Heavy breakable cast		8.50
Stove plate (steel works)		6.50
No. 1 low phos. hvy.	9.50 to	10.00
Couplers and knuckles	7.00 to	7.50
Rolled steel wheels	7.00 to	7.50
No. 1 blast furname (nom.)	3.00 to	3.50
Spec. iron and steel pipe	7.50 to	8.00
Shafting	10.00 to	11.00
Steel axles	13.50 to	14.00
No. 1 forge fire	5.50 to	6.00
Cast iron carwheels	9.00 to	9.50
No. 1 cast	8.50 to	9.00
Cast borings (chem.)	8.00 to	10.50
Steel rails for rolling	9.00 to	9.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$7.00 to	$7.25
No. 2 heavy melting steel	6.50 to	6.75
Compressed sheet steel		6.75
Light bundled sheet stampings	6.00 to	6.25
Drop forge flashings	6.00 to	6.25
Machine-shop turnings	3.75 to	4.00
Short shoveling turnings	5.50 to	6.00
No. 1 busheling	6.25 to	6.50
Steel axle turnings	7.50 to	8.00
Low phos., billet crops	14.00 to	14.50
Cast iron borings	5.25 to	5.75
Mixed borings and short turnings	5.25 to	5.75
No. 2 busheling	5.25 to	5.75
No. 1 cast	7.50 to	8.00
Railroad grate bars	6.00 to	6.50
Stove plate	6.00 to	6.50
Rails under 3 ft.	10.00 to	10.50
Rails for rolling	11.00 to	12.00
Railroad malleable	9.50 to	10.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel		$7.00
No. 2 heavy melting scrap		5.00
Scrap rails	$7.00 to	$7.50
New hydraul. comp. sheets		5.00
Old hydraul. comp. sheets		4.00
Drop forge flashings		5.00
No. 1 busheling		5.00
Hvy. steel axle turnings		6.50
Machine shop turnings		5.00
Knuckles and couplers		10.00
Coil and leaf springs		10.00
Rolled steel wheels		10.00
Low phos. billet crops	10.50 to	11.00
Short shov. steel turnings	6.00 to	6.50
Short mixed borings and turnings	5.25 to	5.75
Cast iron borings	5.25 to	5.75
No. 2 busheling	3.50 to	4.00
Steel car axles	10.00 to	11.00
Iron axles	10.00 to	11.00
No. 1 machinery cast	9.00 to	9.50
No. 1 cupola cast	8.25 to	8.75
Stove plate	7.25 to	7.50
Steel rails, 3 ft. and under	10.00 to	10.50
Cast iron carwheels	8.00 to	9.00
Industrial malleable	8.00 to	8.50
Railroad malleable	8.00 to	8.50
Chemical borings	7.50 to	8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$7.50 to	$8.00
Scrap steel rails	7.50 to	8.00
Short shoveling turnings	3.50 to	4.00
Stove plate		6.00
Steel axles		12.00
Iron axles		12.00
No. 1 railroad wrought		6.00
Rails for rolling	9.00 to	9.50
No. 1 cast	8.00 to	8.50
Tramcar wheels		8.50
Cast iron borings, chem.		8.50

ST. LOUIS

Dealers' buying prices per gross ton:

Selected heavy steel	$6.75 to	$7.25
No. 1 heavy melting	6.25 to	6.75
No. 2 heavy melting	5.50 to	6.00
No. 1 locomotive tires	6.00 to	6.50
Misc. stand-sec. rails	6.50 to	7.00
Railroad springs	7.50 to	8.00
Bundled sheets	4.25 to	4.75
No. 2 railroad wrought	6.25 to	6.75
No. 1 busheling	5.00 to	5.50
Cast iron borings and shoveling turnings	4.75 to	5.25
Iron rails	7.00 to	8.00
Rails for rolling	8.00 to	8.50
Machine shop turnings	3.00 to	3.50
Heavy turnings	5.00 to	5.50
Steel car axles	9.50 to	10.00
Iron car axles	12.50 to	13.00
Wrot. iron bars and trans.	5.00 to	5.50
No. 1 railroad wrought	4.75 to	5.25
Steel rails, less than 3 ft.	8.50 to	9.00
Steel angle bars	6.50 to	7.00
Cast iron carwheels	5.50 to	6.00
No. 1 machinery cast	7.50 to	8.00
Railroad malleable	4.75 to	5.25
No. 1 railroad cast	5.75 to	6.25
Stove plate	6.00 to	6.50
Relay, rails, 60 lb. and under	16.00 to	16.50
Relay, rails, 70 lb. and over	20.00 to	21.00
Agricult. malleable	5.00 to	5.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$4.00 to	$4.75
No. 2 heavy melting steel	2.00 to	2.25
Heavy melting steel (yard)	2.75 to	3.00
No. 1 hvy. breakable cast	4.50 to	4.75
Stove plate (steel works)	2.75 to	3.00
Machine shop turnings		1.00
Short shoveling turnings		1.00
Cast borings		1.00
No. 1 blast furnace		1.00
Steel car axles	9.75 to	10.00
Iron car axles (nom.)	14.00 to	14.50
Spec. iron and steel pipe	2.75 to	3.00
Forge fire		3.25
No. 1 railroad wrought	4.00 to	4.50
No. 1 yard wrought, long	3.25 to	3.50
Rails for rolling	5.00 to	5.50
No. 1 cast	5.00 to	5.25
No. 2 cast	4.00 to	4.50
Stove plate (foundry)	2.50 to	2.75
Malleable cast (railroad)	4.50 to	5.00
Cast borings (chemical)	6.00 to	6.50

Per gross ton, delivered local foundries:

No. 1 machinery cast		$8.00
No. 1 hvy. cast (cupola size)		7.50
No. 2 cast		6.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$4.00 to	$4.25
Scrap T rails	3.80 to	4.60
Machine shop turnings	.80 to	1.00
Cast iron borings		1.05
Bundled skeleton, long	2.00 to	2.50
Forge flashings	3.00 to	3.50
Blast furnace scrap	0.90 to	1.00
Forge scrap	3.00 to	3.25
Shafting	9.50 to	10.00
Steel car axles	9.00 to	9.50
Wrought pipe	4.00 to	4.25
Rails for rolling	6.00 to	6.50
Cast iron borings, chemical	7.00 to	7.25

Per gross ton delivered consumers' yards:

Textile cast	$7.00 to	$7.50
No. 1 machinery cast	7.50 to	8.00
Stove plate	5.00 to	5.25
Railroad malleable	10.50 to	11.00

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$6.00 to	$7.00
Scrap rails for melting	8.00 to	8.50
Loose sheet clippings	1.50 to	2.00
Bundled sheets	4.75 to	5.25
Cast iron borings	2.75 to	3.25
Machine shop turnings	3.25 to	3.75
No. 1 busheling	4.25 to	4.75
No. 2 busheling	2.50 to	3.00
Rails for roling	9.00 to	9.50
No. 1 locomotive tires	8.50 to	9.00
Short rails	11.75 to	12.25
Cast iron carwheels	8.25 to	8.75
No. 1 machinery cast	10.00 to	10.50
No. 1 railroad cast	8.75 to	9.25
Burnt cast	4.25 to	4.75
Stove plate	4.25 to	4.75
Agricultural malleable	8.00 to	8.50
Railroad malleable	9.00 to	9.50

DETROIT

Dealers' buying prices per gross per ton:

Hvy. melting	$5.00 to	$5.50
Borings and short turnings	2.75 to	3.25
Long turnings	1.75 to	2.25
No. 1 machinery cast	7.50 to	8.00
Automotive cast	9.75 to	10.25
Hydraul. comp. sheets	5.00 to	5.50
Stove plate	3.75 to	4.25
New No. 1 busheling	3.75 to	4.25
Old No. 2 busheling	2.25 to	2.75
Sheet clippings	2.50 to	3.00
Flashings	4.00 to	4.50

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	12.50	10.00
Stove plate	10.00	8.00
Standard carwheels	11.00	8.50
Malleable	10.00	8.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	3.10c.
Squares and flats	3.60c.
Bands	2.95c.
Hoops	3.60c.
Hot-rolled annealed sheets (No. 74), 25 or more bundles	3.15c.
Galv. sheets (No. 24), 25 or more bundles	3.85c.
Hot-rolled sheets (No. 10)	3.10c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	$3.74
Spikes, large	2.50c.
Small	2.75c. to 2.90c.
Boat	3.00c.
Track bolts, all sizes, per 100 count, 70 and 10 per cent off list	
Machine bolts, 100 count, 70 and 10 per cent off list	
Carriage bolts, 100 count, 70 and 10 per cent off list	
Nuts, all styles, 100 count, 73 and 10 per cent off list	
Large rivets, base per 100 lb.	$3.00
Wire, black, soft ann'l'd, base per 100 lb.	2.75
Wire, galv. soft, base per 100 lb.	3.20
Common wire nails, per keg	2.35
Cement coated nails, per keg	2.35

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforcing bars, billet steel	1.75c.
Rail steel reinforcement	1.55c. to 1.65c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.10c.
Flats and squares	3.60c.
Bands, 3/8 in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 22)	3.55c.
Galv. sheets (No. 24)	4.10c.
Hot-rolled sheets (No. 10)	3.20c.
Spikes (3/8 in. and lighter)	3.45c.
Track bolts	4.30c.
Rivets, structural	3.75c.
Rivets, boiler	3.75c.
	Per Cent Off List
Machine bolts	73
Carriage bolts	73
Coach and lag screws	73
Hot-pressed nuts, sq., tap, or blank	73
Hot-pressed nuts, hex., tap, or blank	73
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

NEW YORK

	Base per Lb.
Plates and struc. shapes	2.70c. to 3.10c.
Soft steel bars, small shapes	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	6.00c. to 6.50c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Hot-rolled sheets (No. 10)	3.00c. to 3.25c.
Hot-rolled ann'l'd sheets (No. 24*)	3.60c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	5.00c.
Standard tool steel	12.00c.
Wire, black annealed (No. 10)	3.60c.
Wire, galv. annealed (No. 10)	4.05c.
Tire steel, 1/2 x 1/8 in. and larger	3.40c.
Smooth finish, 1 to 2 1/2 x 1/4 in. and larger	3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Common wire nails, base, per keg	$2.60

	Per Cent Off List
Machine bolts, cut thread:	
3/4 x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
1/2 x 6 in. and smaller	65 to 65 and 10
3/4 x 20 in. and smaller	65 to 65 and 10
Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.	$19.00
Seamless welded, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounsd, shafting, screw stock	3.35c.
Hot-rolled annealed sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Hot-rolled sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	3.85c.
Galv. corrug. sheets	4.40c.
Structural rivets	4.00c.
Boiler rivets	4.00c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb	60
Machine bolts	70
Carriage bolts	70
Lag screws	70
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	70
Less than 200 lb	60
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	70
Less than 200 lb	60

PHILADELPHIA

	Base per Lb.
Plates, 1/4-in. and heavier	2.45c.
Structural shapes	2.45c.
Soft steel bars, small shapes, iron bars (except bands)	2.45c.
Reinforc. steel bars, sq., twisted and deform.	2.30c.
Cold-fin. steel, rounds and hex.	3.30c.
Cold-fin. steel, sq. and flats	3.80c.
Steel hoops	3.00c.
Steel bands, No. 12 to 3/16-in., incl.	3.75c.
Spring steel	5.00c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	3.75c.
Hot-rolled and annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, 1/4 in.	5.00c.
Swedish iron bars	5.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 1.95c.
Cold-fin. rounds and hex.	3.10c.
Cold-fin. flats and sq.	3.60c.
Hoops and bands, No. 12 to 3/8 in., inclusive	3.00c.
Hoops and bands, No. 13 and lighter	3.55c.
Cold-finished strip	*5.55c.
Hot-rolled annealed sheets (No. 24)	3.25c.
Galvanized sheets (No. 24)	3.75c.
Hot-rolled sheets (No. 10)	3.00c.
Black ann'l'd wire, per 100 lb.	$2.75
No. 9 galv. wire, per 100 lb.	3.20
Com. wire nails, base per keg	2.35

*Net base, including boxing and cutting to length.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rails steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex	3.50c.
Squares	4.00c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot rolled sheets (No. 10)	3.80c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (10 to 49 kegs)	2.65
Larger quantities	2.50
Cement c'l'd nails, base 100-lb. keg	2.95
Chain, per 100 lb.	10.25
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$17.50
4-in.	36.00
Lap-welded steel boiler tubes, 2-in.	16.50
4-in.	34.50

BUFFALO

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.65c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.10c.
Bands	3.35c.
Hoops	3.90c.
Hot-rolled sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$2.45
Black wire, base per 100 lb.	3.20

BOSTON

	Base per Lb.
Plates	*3.35c.
Structural shapes	*3.35c.
Soft steel bars, small shapes	*3.25c.
Reinforcing bars	3.10c. to 3.25c.
Iron bars—	
Refined	3.25c.
Best refined	4.60c.
Spring steel, open-hearth	5.00c.
Tire steel	4.50c. to 4.75c.
Bands	*3.75c. to 4.25c.
Hoop steel	4.90c. to 5.40c.
Cold-rolled steel—	
Rounds and hex.	3.50c. to 5.50c.
Squares and flats	4.00c. to 6.00c.
Rivets, structural or boiler	4.80c.
	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Lag screws	70
Hot-pressed nuts	40 and 10
Cold-punched nuts	40 and 10
Stove bolts	70 and 10

*Base price (250 to 999 lb.); less than 250 lb., add 50c. per 100 lb.; 1000 to 7999 lb., deduct 15c.; 8000 to 14,999 lb., deduct 25c.; 15,000 lb. and larger lots, deduct 35c.

PACIFIC COAST

	Base Per Lb. San Francisco	Los Angeles	Seattle
Plates and struc. shapes, 1/4-in. and heavier	3.15c.	3.15c.	2.75c.
Soft steel bars	3.15c.	3.15c.	2.75c.
Reinforcing bars	2.80c.	2.80c.	3.00c.
Hot-rolled annealed sheets (No. 24)	3.95c.	4.20c.	4.25c.
Hot-rolled sheets (No. 10)	3.50c.	3.50c.	3.75c.
Galv. sheets (No. 24)	4.55c.	4.50c.	4.75c.
Struc. rivets, 1/2 in. and larger, less than 1000 lb.	5.00c.	5.00c.	4.00c.
Cold-finished steel bars and shaftings:			
Rounds	5.25c.	5.15c.	4.25c.
Squares	6.25c.	6.15c.	5.50c.
Hexagons	6.25c.	5.15c.	5.50c.
Flats	6.75c.	6.15c.	6.50c.
Common wire nails, base per keg in less carloads	$2.75	$2.75	$2.85

Plates, shapes, bars, bands and hot-rolled sheets, No. 16 gage and heavier, subject to differentials for quantity.

PLANT EXPANSION AND EQUIPMENT BUYING

Large Machine Tool Orders for Russia

Amtorg Trading Corpn. Buying on a Program That May Total About $1,500,000

THE Amtorg Trading Corpn., New York, buying representative for Soviet Russia, has placed some substantial machine tool orders, one of which totaled about $300,000. The total purchases of Amtorg may amount to $1,500,000, a considerable proportion having already been placed. Long-term credits are being granted by sellers, some running for about two years.

An automobile company is reported to have bought 16 lathes. Several Henry & Wright presses have been sold to the Statesville Prison in Illinois for the manufacture of automobile license plates.

The general run of machine tool business is exceedingly dull, there being no reports of improvement, while in some centers orders are fewer than they have been in recent months. Most of the inquiries that have been quoted on in recent months are inactive and probably will not be revived until the business situation as a whole has taken a definite turn for the better.

NORTH ATLANTIC

Signal Supply Officer, Signal Corps, Army Base, Brooklyn, asks bids until May 17 for 60 to 120 eliminators (Circular 133); until May 23 for scales in lots of 100 to 500 (Circular 136), 45 test sets (Circular 137); until May 27 for equipping gasoline prime movers with generators, 9 to 12 units in all (Circular 135); until May 31 for filters, lamps, signal lamps, etc. (Circular 134).

Display Equipment Corpn., New York, has been organized by Samuel Lieberman, 1115 Jerome Avenue, Bronx, and Morris Sarett, 144 Beach 77, Arverne, L. I., to manufacture metal display fixtures and equipment.

National Screen Service Corpn., 126 West Forty-sixth Street, New York, motion picture equipment, will occupy part of building at Ninth Avenue and West Forty-sixth Street, now being remodeled and will install equipment for expansion.

Commanding Officer, Picatinny Arsenal, near Dover, N. J., asks bids until May 17 for 106,000 primer and body assemblies, 106,000 lead wads, etc. (Circular 322).

Dewey Die-Casting Corpn., New York, has been organized by Frank W. Dewey, 6806 Owl Head Court, Brooklyn, and associates, to manufacture die-casting and operate general machine works.

Rice Electric Refrigeration, Inc., 36 Flatbush Avenue, Brooklyn, electric refrigerating equipment, has arranged for increase in capital from 1000 shares of stock, no par value, to $110,000 for general expansion.

Roosevelt Field, Inc., Roosevelt Field, Garden City, L. I., plans rebuilding of hangar A, with shop and repair facilities, recently destroyed by fire. Loss over $45,000 with equipment.

Interstate Millwright Co., Newark, N. J., recently organized, has leased space in building at 357 Mulberry Street for a machine repair shop.

Kullman Dining Car Builders, Inc., 390 Frelinghuysen Avenue, Newark, manufacturer of dining car units, is running on normal production schedule with full working force. Company has secured orders to insure this output for several months.

Raritan Copper Works, Elm and Market Streets, Perth Amboy, N. J., is planning to rebuild power plant recently destroyed by fire. Loss over $40,000 with equipment.

Art Color Printing Co., South Washington Avenue, Dunellen, N. J., let general contract to Wigton-Abbott Corpn., 143 Liberty Street, New York, for one-story and basement addition, 50 x 200 ft. Cost about $50,000 with equipment.

Mack Machine Co., Harrison, N. J., has been organized with capital of $50,000 to take over and expand company of same name at 300 Passaic Avenue, manufacturer of refrigerating machinery. George W. Mack is head.

Board of Education, Administration Building, Jersey City, N. J., will install manual training department in multi-story senior high school at Hudson Boulevard and Culver Avenue, for which plans are being drawn by John T. Rowland, 30 Journal Square, architect. Cost over $1,500,000 with equipment.

Department of Public Affairs, City Hall, Newark, Jerome T. Congleton, mayor, director, is considering one-story industrial plant near Haynes Avenue viaduct, Port Newark, 40,000 sq. ft. floor space, to be leased to company whose name is temporarily withheld. Cost about $75,000 exclusive of equipment.

Marcalus Mfg. Co., Elizabeth, N. J., has been organized with capital of $125,000 by Nicholas Marcalus, 527 Riverside Drive, and associates to manufacture machinery and parts.

J. L. Mott Co., Inc., Lalor and Hancock Streets, Trenton, N. J., manufacturer of plumbing equipment, etc., bankrupt; real estate and property of company will be offered at public sale May 25 by Louis Gerber, Broad Street Bank Building, special master in bankruptcy.

Remington-Reeve, Inc., Trenton, N. J., care of David L. Smith, Hopewell, N. J., has been organized by Mr. Smith and Arthur B. Reeve, Trenton, to manufacture fountain pens, metal pencils, etc. Company is considering lease of factory.

Springfield Metallic Casket Co., 1415 Spring Garden Street, Philadelphia, with main plant at Springfield, Ohio, has leased four-story and basement building at 1229 North Broad Street for factory branch, storage and distributing plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 17 for 25 aircraft gyro horizons (Schedule 7978) and 200,000 ft. high-tension electric cable (Schedule 7993) for Philadelphia Navy Yard.

Art Iron & Metal, Inc., Philadelphia, has been organized by Harry A. Whartenby, 325 East Horter Street, and Henry E. Muller, 2110 North Twenty-eighth Street, to manufacture iron, steel and other ornamental metal products.

Bell Telephone Co. of Pennsylvania, 1835 Arch Street, Philadelphia, has authorized new appropriation of $197,970 for extensions and improvements in different parts of State, including buildings, automatic station equipment, overhead and underground lines, service facilities, etc. This makes total fund of $3,190,259 authorized since first of year.

Quartermaster Depot, Twenty-first and Johnston Streets, Philadelphia, asks bids until May 20 for one 100-ft. steel flagpole (Circular 20).

Board of Education, 851 North Evans Street, Pottstown, Pa., plans manual training department in three-story and basement junior high school, 300 x 320 ft. General contract let to A. W. Funk Co., Commercial Trades Building, Philadelphia. Cost about $325,000. Hasness & Albright, Harrisburg, Pa., architects.

Borst Engineering Co., Inc., 529 Colvin Avenue, Buffalo, manufacturer of machinery for making soap packets and similar products for vending machines, will occupy one-story plant at Angola, N. Y., to be built by Angola Board of Trade. Cost about $40,000. Buffalo plant will be removed to new location and capacity increased.

Metal Specialties Co., Buffalo, recently organized to manufacture parts and equipment for motion picture machines, has leased building at 9 Lafayette Avenue, 4500 sq. ft. floor space, for new plant.

Jamestown Malleable Iron Corpn., Jamestown, N. Y., has been organized with capital of $100,000 to take over and expand Jamestown Malleable Products Corpn. Frank O. and Alfred A. Anderson head new company.

SOUTH ATLANTIC

Poole Foundry & Machine Co., Union Avenue and Clipper Mill Road, Baltimore, has been organized by Lawrence M. Ricketts and S. Proctor Brady, Woodberry, Baltimore, to manufacture machinery and parts, iron and other metal castings.

Chief of Engineers, Munitions Building, Washington, asks bids until May 20 for two air compressors, one wood boring machine, one circular saw, two pneumatic drills, one paving breaker, two sets drill steel, three clay diggers and other equipment (Circular 32).

Potter Engineering Co., 1241 West Forty-seventh Street, Norfolk, Va., T. H. Potter, head, plans purchase of pulverizing equipment.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has secured contract for reconditioning and equipping two ships of Mississippi Shipping Co. at $351,700.

Board of District Commissioners, District Building, Washington, asks bids until May 20 for 25,000 steel sheets, 13 x 61 in. for auto blanks, or alternate, 250,000 steel blanks, 6 x 13 in.; until May 18 for five job printing presses; until May 25 for one steam jacketed pressure vacuum sterilizer.

South Dorchester Electric Light & Power Co. care of George W Lindsay, Baltimore Trust Building, Baltimore, recently organized, has secured permission to build an electric generating plant on Hoopers Island, with transmission line to lower end of island for light and power service

Northern Virginia Power Co., Winchester, Va., operated by Potomac Edison Co., Hagerstown, Md., is considering erection of a high-tension transmission line from Winchester to Martinsburg, W. Va., and vicinity. Cost about $125,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 17 for 72 soot blowers and spare parts for Norfolk Navy Yard (Schedule 7983), for 126 steel head shells for Newport Navy Yard (Schedule 7959), one motor-driven turret lathe (Schedule 7887) and one electric truck for Hampton Roads Navy Yard (Schedule 7991).

AMERICAN

STEEL SHEETS *for* EVERY PURPOSE

AMERICAN SHEET AND TIN PLATE COMPANY PITTSBURGH

We also manufacture

USS STAINLESS and Heat Resisting STEEL SHEETS AND LIGHT PLATES

AMERICAN Products are well made in every particular, with close adherence to uniform quality standards—the kind that makes friends and keeps them. Supplied in Black and Galvanized Sheets, Special Sheets, Tin and Terne Plates for all known purposes; also KEYSTONE Copper Steel Products for uses requiring maximum resistance to corrosion. Send for literature.

American Sheet and Tin Plate Company

GENERAL OFFICES: Frick Building, PITTSBURGH, PA.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES:

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL & WIRE COMPANY
CARNEGIE STEEL COMPANY
COLUMBIA STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPB'LDG. & DRY DOCK CO.
ILLINOIS STEEL COMPANY
MINNESOTA STEEL COMPANY
NATIONAL TUBE COMPANY
OIL WELL SUPPLY COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & R.R. COMPANY
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors—Columbia Steel Company, San Francisco, Calif.
Export Distributors—United States Steel Products Company, New York, N. Y.

one set air ejector equipment and spare parts for New York or San Francisco yards (Schedule 7998); until May 24 for wire boiler tube brushes and brush sections for New York and San Diego Navy yards; conduit pipe (Schedule 8004), cocks, faucets and valves (Schedule 7967), brass and copper pipe, and copper tubing (Schedule 8018), welded iron pipe (Schedule 8020), and 60 water gages for boilers (Schedule 8030) for Eastern and Western yards.

Pensacola Tool & Supply Co., Pensacola, Fla., recently organized by George D. and Richard V. Cowley, Pensacola, has leased property formerly occupied by Pensacola Shipbuilding Co. for manufacture of tools and other equipment.

Virginia Public Service Co., Charlottesville, Va., is planning to rebuild power plant and ice-manufacturing plant at Culpeper, Va., recently destroyed by fire. Loss about $100,000 with machinery.

United States Engineer Office, Jacksonville, Fla., asks bids (no closing date stated) for construction of 60-ft. steel barge.

CENTRAL DISTRICT

Enterprise Machine Works, Seventh Street and Eighth Avenue, Beaver Falls, Pa., has plans for a one-story machine shop, 40 x 90 ft.

Chief of Engineers, Washington, is planning two locks and dams on Allegheny River, near Pittsburgh, to replace structures at Aspinwall and Springdale. Cost about $4,906,000 with power plants, operating machinery and other equipment. When project is authorized, bids will be asked by United States Engineer Office, Pittsburgh.

Dravo Contracting Co., Pittsburgh, is operating on increased production schedule at Neville Island shipyards, and has launched three steel hull dredges in past 10 weeks; fabricating works are busy on steel production for two stern-wheel dredge boats for Government service in St. Louis district.

Gulf Refining Co., Frick Annex, Pittsburgh, is considering new bulk oil storage and distributing plant at Paducah, Ky. Cost over $50,000 with equipment.

Lang & Rodkey, Inc., Warren, Ohio, plans erection of hangar, with repair shop at municipal airport, where expansion program will be carried out.

New Method Stove Co., Mansfield, Ohio. Plant and machinery of this company will be sold by Henry B. Sanford, receiver.

Morris Packaging Equipment Co., Toledo, Ohio, has been organized by Howard A. Morris, 1579 Colton Street, and associates to manufacture packing machinery and parts.

Cleveland Heater Co., 1900 West 112th Street, Cleveland, manufacturer of automatic gas and electric water heaters, has taken bids on general contract for one-story addition, 100 x 239 ft. George S. Rider, Marshall Building, is architect and engineer.

Duplex Mfg. & Foundry Co., Elyria, Ohio, recently organized by Lloyd Brown and associates, has purchased Duplex Foundry Division of Jaeger Machine Co., Columbus, Ohio, manufacturer of contractors' machinery and other heavy equipment, at Elyria. New company will operate at once.

T. J. Lane Co., Springfield, Ohio, is planning purchase of a gyratory crusher and screens.

City Council, Bridgeport, Ohio, is considering erection of a municipal electric light and power plant, with municipal waterworks station.

Kiner Packing Co., 1080 East Hudson Street, Columbus, Ohio, plans rebuilding of part of meat-packing plant, recently destroyed by fire. Loss about $40,000 with equipment.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until May 17 for 13 motor-driven drill presses (Circular 383); until May 18 for one milling machine (Circular 380), two metal cold cutting saws (Circular 379), 35 bench type dial scales (Circular 377); until May 23 for one portable pyrometer, 26 indicating type pyrometers, 26 rotary selector switches, quantity of thermocouple wire (Circular 378), 3600 synchronizer generator cam follower assemblies (Circular 381), 200 camera gun mount assemblies (Circular 384), 400 sets lamp assemblies (Circular 385); until May 16 for 75 gun synchronizer control unit assemblies, 75 case ejection container assemblies, 75 link ejection container assemblies (Circular 375).

Strong Mfg. Co., Sebring, Ohio, recently organized, has taken title to plant and business of company of same name, manufacturer of enameled iron products, and will resume operations soon. John Allen is vice-president; and Fred Shaffer, secretary and treasurer.

City Council, City Hall, Columbus, Ind., Fred Owens, city clerk, is asking bids, closing about May 21, for extensions and improvements in municipal electric light and power plant, including installation of Diesel engine, generator and auxiliary equipment. John W. Moore & Son, Indiana Pythian Building, Indianapolis, are consulting engineers.

Acme Machine Products Co., Kalamazoo, Mich., will remove plant to Muncie, Ind., and consolidate with works of company at that place.

Snodgrass & Schaefer, Inc., 2514 Bethel Avenue, Indianapolis, operating a sheet metal plant, has changed name to Brad-Snodgrass, Inc.

Frank and Edmond Ball, Muncie, Ind., officials of Ball Brothers Co., with local glass plant, have plans for one-story hangar with repair facilities, 80 x 80 ft. at airfield north of city.

New York, Chicago & St. Louis Railroad Co., Indianapolis, Nickel Plate System, has adopted full time, six-day week production at locomotive repair shops at Frankfort, Ind., following curtailed schedule for several months.

Otto Flottorp, Grand Rapids Airport, Grand Rapids, Mich., manufacturer of airplane propellers, etc., has plans for new one-story plant.

Continental Motors Corpn., Muskegon, Mich., manufacturer of gasoline engines and motors, parts, etc., has purchased Divco Detroit Corpn., 2435 Merrick Street, Detroit, manufacturer of special type milk delivery truck. Acquiring company has organized Continental Divco Co., to operate business. W. R. Angell, Roger Sherman and F. F. Beall head new company.

Forging & Casting Corpn., 1101 Wanda Street, Ferndale, Detroit, has arranged for increase in capital by amount of $250,000, part of fund to be used for expansion.

Consolidated Cement Co., Cement City, Mich., is planning to rebuild part of mill recently damaged by fire. Loss over $50,000 with equipment.

Acme Ball Bearing & Mfg. Co., Detroit, has been organized by Howard P. Cogger and Theodore J. Freund, 12245 Turner Avenue, to manufacture ball bearings and other precision metal products.

S. E. Overton Co., South Haven, Mich., has plans for a steam power plant at local woodturning and wood-working mill. Cost about $35,000 including equipment.

United States Rubber Co., 6600 East Jefferson Street, Detroit, has increased production in local tire mill to three 8-hr. shifts daily, five-day week basis, giving employment to about 3000 men. Plant has been on a four-day week schedule.

Machinery Forging Co., 5450 Hamilton Avenue, Cleveland, will be offered at public auction May 21 by Norbert K. Hirshman, receiver.

Russell R. Lentz, Jefferson Lentz and Edward Meyer have purchased Prosch Boiler Works, 1430 Ash Street, Terre Haute, established 30 years ago. Company will continue to make boilers, tanks and structural steel and is installing considerable new equipment.

SOUTHWEST

Purchasing Officer, Department of Interior, United States Indian Warehouse, 806 Spruce Street, St. Louis, asks bids until June 1 for tools, tool grinders, wire cloth, hardware, pipe and fittings, wire, scales, locks and other equipment for fiscal year 1933 (Schedule 17).

Board of Education, Savannah, Mo., plans installation of manual training department in new multi-story high school, for which bids are being asked on general contract until May 17. Cost over $150,000. Eckel & Aldrich, Corby Building, St. Joseph, Mo., architects.

Universal Atlas Cement Co., Independence, Kan., subsidiary of United States Steel Corpn., has resumed production, following shutdown for several months.

Keller Mfg. Co., St. Louis, has been organized by William J. Keller, 2906 Arsenal Street, and associates, to manufacture lamps and kindred equipment.

United States Engineer Office, Kansas City, Mo., asks bids until May 16 for one fuel oil-burning unit (Circular 548), one combustion chamber, or Dutch oven (Circular 546); until May 17 for one 45-hp. vertical steam boiler and one steam-driven horizontal duplex pump.

Missouri-Pacific Railroad Co., St. Louis, has resumed operations at repair shops at Sedalia, Mo., and Little Rock, Ark., giving employment to about 750 men.

Wirt-Franklin Petroleum Corpn., Ardmore, Okla., has arranged for merger with Cromwell-Franklin Oil Co. and Virginia Petroleum Co. of Oklahoma, operating oil properties, pipe lines, etc. Expansion and improvements are planned.

First National Television, Inc., Fairfax Airport, Kansas City, Mo., is considering erection of a new 500-watt television station, including power station, towers, etc.

Sterling Refining Co., Hunt Building, Tulsa, Okla., B. F. Green, in charge, is carrying out expansion and improvements at oil refinery, to include installation of gasoline production equipment. Cost over $45,000 with equipment.

Strang Air-Conditioning Corpn., Kansas City, Mo., organized by Emil P. Brus, 5809 Virginia Street, to manufacture air conditioning equipment and parts.

Constructing Quartermaster, Army and Navy General Hospital, Hot Springs, Ark., asks bids until May 24 for one horizontal centrifugal pump with starter and control equipment.

Commercial Pulp & Paper Co., Orange, Tex., recently organized, plans two one-story additions to mill of Yellow Pine Paper Mill Co., acquired for new plant, 85 x 175 ft., and, 60 x 175 ft. Cost over $90,000 with equipment. Sumner M. Bump is president.

Southern Alkali Corpn., Corpus Christi, Tex., an interest of American Cyanamid Co., New York, and Pittsburgh Plate Glass Co., Pittsburgh, has purchased natural gas production from 2678 acres in Saxet district, Nueces County, Tex., with six-gas-producing wells, and will use at proposed alkali and chemical plant at Corpus Christi where 350-acre site was purchased several month ago. Pipe line will be built to plant site later. Entire project will cost over $2,500,000.

Benjamin Branson, Lubbock, Tex., and associates plan erection of airport on Plainview Hfghway, with hangar and repair shop and other field units.

R. F. Watkins, Inc., Fort Worth, Tex., has been organized by Raymond A. Johnson and Raymond F. Watkins, 3637 Avenue K, to manufacture metal products.

MIDDLE WEST

United States Engineer Office, Rock Island, Ill., asks bids (no closing date stated) for lock-operating machinery, power house equipment, electric power and control system for power dam at lock and dam No. 15, Mississippi River.

Sonora Mfg. Co., 2613 Milwaukee Avenue, Chicago, manufacturer of radio equipment, is planning a new 5000-watt television broadcasting station, with power station, towers, etc.

Illinois Gear & Machine Co., 1025 South Menard Street, Chicago, has been organized by Gunner E. Gunderson and Vincent P. Reilly, to manufacture gears and other mechanical products.

State Commissioner of Purchases, room 10, State Capitol Building, St. Paul, asks bids until May 17 for 150 kw. engine-generator unit and auxiliary equipment for power plant at State institution, Anoka, Minn. Druar & Milinowski, Globe Building, St. Paul, are consulting engineers.

Ford Motor Co., Dearborn, Mich., is increasing production at assembling plant at St. Paul, Minn., adding over 400 men to working force, making present quota of about 900 men.

City Council, Milford, Iowa, is considering a municipal electric light and power plant. Cost about $80,000 with equipment. Buell & Winter Engineering Co., Insurance Exchange Building, Sioux City, Iowa, is engineer.

McCrea Fixture Co., Sixth Street, Great Falls, Mont., is considering erection of one-story plant, 80 x 150 ft., for manufacture of store fixtures, etc.

City Council, Red Wing, Minn., has plans for municipal electric power plant, with turbo-generator units and auxiliary equipment, and extensions and improvements in light and power system. Cost about $800,000. R. J. Torrens, Shubert Building, St. Paul, is consulting engineer.

Grigsby-Grunow Co., North Kolmer Avenue, Chicago, manufacturer of radio equipment, has adopted capacity production schedule in electric refrigerator plants, operating on 24-hr. day basis.

General Manganese Corpn., 155 West Congress Street, Detroit, has taken options on 50 acre tract near Sioux Falls, S. D., and will

makes good steel better

The consistent use and steady sales of Ferro Carbon-Titanium during the lean years of 1930-31 is convincing proof of the acknowledged value of this reliable deoxidizer. Especially true is this in the manufacture of steels for high grade Strip, Auto Body Stock and Plate. Open-hearth operators almost to a man praise Ferro Carbon-Titanium as the final ladle addition for high quality steels.

THE TITANIUM ALLOY MANUFACTURING CO.

NIAGARA FALLS, N. Y.

BRANCH OFFICES

60 John Street
New York City

Keith Building
Cleveland, Ohio

AGENCIES

PACIFIC COAST
Balfour, Guthrie & Co., San Francisco, Los Angeles, Portland, Seattle, Tacoma, Vancouver, B. C.

GREAT BRITAIN AND EUROPE
T. Rowlands & Co., Ltd., Sheffield, Eng.

have plans drawn for manganese concentrating mill. Initial unit will cost over $250,000 with machinery. Company has manganese properties for raw material supply in that district.

Combustioneer, Inc., 1801 West Madison Street, Chicago, manufacturer of oil burning equipment, automatic coal stokers, etc., will remove plant from Goshen, Ind., to Springfield, Ohio.

City Council, Lincoln, Neb., asks bids until June 1 for equipment for municipal pumping plant, including one 4000-kw. turbo-generator unit, surface condenser, switchboard, etc. Cost about $200,000. Theodore H. Berg, City Hall, city clerk; D. L. Erickson, City Hall, engineer.

Sioux City Gas & Electric Co., Sioux City, Iowa, is considering extensions and improvements in Bix Sioux electric generating plant, including equipment to change from coal to natural gas fuel. Pipe lines will be built. Cost about $90,000 with equipment.

Royal Drapery Hardware Co., Milwaukee, has been incorporated by Lazarus Altfeld, Anton Raichle and Alvin Sable, attorney, 152 West Wisconsin Avenue, to manufacture ornamental metal products. Space has been leased at 500 North Water Street and equipment is being installed.

A. O. Smith Corpn., Milwaukee, has booked orders for six large cracking stills from two refinery interests, identity of which is not revealed.

Common Council, LaCrosse, Wis., is considering plans by J. T. Hurd, city engineer, for new municipal garage and maintenance shop, to cost $35,000. Action is expected about May 15.

Village Board, Kohler, Wis., William Nesemann, clerk, closed bids May 11 on construction and equipment of sewage disposal plant and extension and improvement of existing system for which bond issue of $100,000 was voted April 5. Project is in charge of Jerry Donohue Engineering Co., Sheboygan, Wis.

L. D. Fisher & Son Corpn., Milwaukee, has been incorporated with $25,000 capital to take over business of L. D. Fisher Co., 757 North Broadway, broker in iron, steel, brass, scrap iron and other metals. Principals are Louis D. Fisher and Irving D. Fisher.

Village Board, Newberry, Mich., is considering plans for installation of steel standpipe of 100,000 gal. capacity. T. A. Anderson is village engineer.

NEW ENGLAND

Crompton & Knowles Loom Works, Worcester, Mass., manufacturer of textile machinery and parts, has leased former mill of Anchor Webbing Co., Pawtucket, R. I., for new branch plant. Portion of Providence works will be removed to new location. Company also plans to remove assembling departments from Providence plant to Worcester works, where capacity in that division will be increased.

Aranosian Oil Co., West Concord, N. H., has plans for oil storage and distributing plant at Concord, N. H. Cost about $35,000 with equipment. Nat Simons, 33 North Main Street, Concord, architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 17 for one motor-driven thermo plastic molding press (Schedule 7989), four transmitters, six indicators and spare parts (Schedule 7929) for Portsmouth Navy Yard.

Ford Motor Co., Dearborn, Mich., is advancing production at assembling plant at Somerville, Mass., and is now running on six-day week basis, 10-hr. day, with double shifts in several departments.

Powsner Auto Metal Works, Inc., New Haven, Conn., has been organized by Joseph Powsner, 1552 Boulevard, and H. P. Lander, 215 Lakeview Terrace, to manufacture sheet metal products.

Christian Science Publishing Society, 107 Falmouth Street, Boston, will soon begin superstructure for four and nine-story printing plant. General contract let to Aberthaw Co., 80 Federal Street. Cost about $3,000,000 with machinery, all of which will be electric-operated. Chester Lindsay Churchill, 9 Newbury Street, is architect.

General Metal Repair Co., Inc., Pawtucket, R. I., has been organized by Thomas F. Vance, 210 Central Avenue, and associates to operate general metal-working and repair plant.

New England Cooperative Air-Craft School, 126 Newbury Street, Boston, has leased portion of hangar of Ames-Skyways Corpn., at Boston municipal airport, and will occupy in June. Mechanical shop and training facilities at airport will be developed for student service. Captain Hilding N. Carlson is head.

SOUTH CENTRAL

Constructing Quartermaster, Maxwell Field, Ala., asks bids until May 31 for construction of seven standard magazines. Cost about $15,000.

Dixie Greyhound Bus Line Co., 146 Union Avenue, Memphis, Tenn., plans installation of machine and repair shop, forge shop, brake department and other mechanical divisions in one-story service, garage and station building, 115 x 315 ft. Cost over $100,000. Jones, Furbringer & Jones, Porter Building, architects.

Southern Cotton Oil Co., Canal Bank Building, New Orleans, is considering rebuilding of branch plant at Goulding, near Pensacola, Fla., recently destroyed by fire. Loss over $100,000 with equipment.

General Oil Co., Birmingport, near Ensley, Ala., will build new bulk oil storage and distributing plant, total capacity 500,000 gal. Contract for two main storage tanks has been let to Birmingham Boiler & Engineering Co., Birmingham.

United States Engineer Office, Memphis, Tenn., asks bids until June 1 for constructing two steel hull whirler derrick boats (Circular 611).

Sonny Brook Oil & Gas Co., Horse Cave, Ky., W. A. McGuire, secretary, is considering gasoline producing plant at oil properties.

State Highway Commission, Frankfort, Ky., has adopted budget of $32,000,000 for road construction during next 24 months, of which $1,500,000 will be used for purchase of road-building and maintenance machinery.

PACIFIC COAST

Swift & Co., 3750 Jewel Street, Vernon, Cal., meat packers, with headquarters at Chicago, plans three-story addition to packing plant. Cost over $85,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, let general contract to Robert E. McKee, 1534 East Florence Avenue, Los Angeles, for industrial buildings at Naval air station, Sunnyvale, Cal., at $165,700; also for helium repurification plant at same station to Helium Co., Louisville, Ky., at $133,500.

Ryan Airport, San Diego, Cal., T. Claude Ryan, head, has awarded general contract to L. T. Olmstead Building Co., 2255 Fifth Avenue, for air terminal at Lindbergh Field, to include hangar with repair shop and other field units. Cost about $50,000 with equipment.

Ford Motor Co., Dearborn, Mich., has resumed production at assembling plant at Long Beach, Cal., and will give employment to about 500 men, to be increased soon.

Reno Clay Products Co., Reno, Nev., recently organized as interest of Reno Press Brick Co., is planning installation of brick machinery, conveying, power and other equipment for local plant. John B. Boyd is head.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 17 for one motor-driven ball bearing band saw (Schedule 7988) for Mare Island Navy Yard quantity of steel boiler tubes (Schedule 7977) for San Francisco yard, 3860 lb. corrosion-resisting bar steel (Schedule 8009) for Puget Sound yard; until May 24 for one motor-driven metal saw grinding machine (Schedule 7971), and 19,090 lb. alloy steel rack forgings (Schedule 8037) for Mare Island yard, 15,450 single trip steel containers (Schedule 7998) for San Francisco yard, and one high-speed steel treating furnace (Schedule 7995) for San Diego Yard.

Ray Brown Canning Co., Woodburn, Ore., has plans for one-story addition, 30 x 140 ft., part of unit to be equipped as a machine shop.

Consolidated Furniture Co., 380 Eugene Street, Portland, Ore., has plans for one-story plant, 68,000 sq. ft. floor space, at Squalicum Creek Waterway, Bellingham, Wash. All machinery will be electric operated. Part of unit will be equipped as sawmill. Cost about $90,000 with machinery. A. R. McBurgh is president.

Neu-Bart Stamping & Mfg. Co., Los Angeles, care of Koenig & Brunton, 303 Lane Mortgage Building, representative, has been organized by Andrew H. Neubauer and Guy Bartholomew, Los Angeles, to manufacture metal stampings and kindred products.

Idaho Meat Producers Cooperative Association, Caldwell, Idaho, is considering new meat-packing plant, to include power house, machine shop and other mechanical units. Cost over $150,000 with equipment.

FOREIGN

Procter & Gamble Co., Gwynne Building, Cincinnati, manufacturer of soaps, washing powders, etc., is planning expansion in England and will build or purchase a plant near London. Company has controlling interest in Thomas Hedley & Co., Ltd., Newcastle-on-Tyne, England, manufacturer of soaps, and will operate new plant under same management. Cost over $100,000.

South African Railways and Harbor Board, Johannesburg, South Africa, asks bids until June 6 for vacuum brake gear, valve diaphragms, vertical ball valve diaphragms, pipe, rolling rings, joint rings, coupling washers, and other railroad equipment.

Department of Communications, Madrid, Spain, plans series of broadcasting stations, with new unit at Madrid of 60 to 100 kw. capacity, one each at Seville and Valencia, and relay stations at Bilbao, Coruna, Valladolid, Murcia and other points. Cost over $500,000 with power stations, steel towers, antenna equipment and accessories.

Soviet Russian Government, Moscow, has authorized appropriation of 78,100,000 rubles (about $39,050,000) for additional construction at Magnitogorsk steel mills in Urals, including two new blast furnaces, completion of open-hearth furnace and other primary work. About 202,000,000 rubles ($101,000,000) will be expended for new construction at steel mills at Kuzneta, Siberia, including furnace units, as well as group of housing projects for mill employees. Amtorg Trading Corpn., 261 Fifth Avenue, New York, is official buying agency.

Office Changes

Kalman Steel Corpn. has removed its Milwaukee office from Guaranty Building to room 1204, Warner Building, 212 West Wisconsin Avenue.

Globe Steel Tubes Co. and **Globe Stainless Tube Co.** have removed their St. Louis offices to 1249 Syndicate Trust Building. Edwin C. Carroll is district manager of sales.

Standard Steel & Rail Co., St. Louis, has removed its offices to 701 St. Louis Mart Building, Twelfth Boulevard at Spruce Street.

Pennsylvania Pump & Compressor Co., Easton, Pa., has moved its New York office to 1005 Evening Post Building, 75 West Street.

Ferrostaal, Inc., New York, steel importer, has moved its offices from 40 Rector Street to 500 Fifth Avenue.

Concrete Reinforcing Steel Institute has moved its offices to 333 North Michigan Boulevard, Chicago, Ill.

Union Iron & Metal Co., Pittsburgh, has moved its offices to Ninth and Bingham Streets, S. S.

Erman-Howell & Co., Inc., Chicago, has removed its office from McCormick Building to its car dismantling plant at 300 West Eighty-seventh Street.

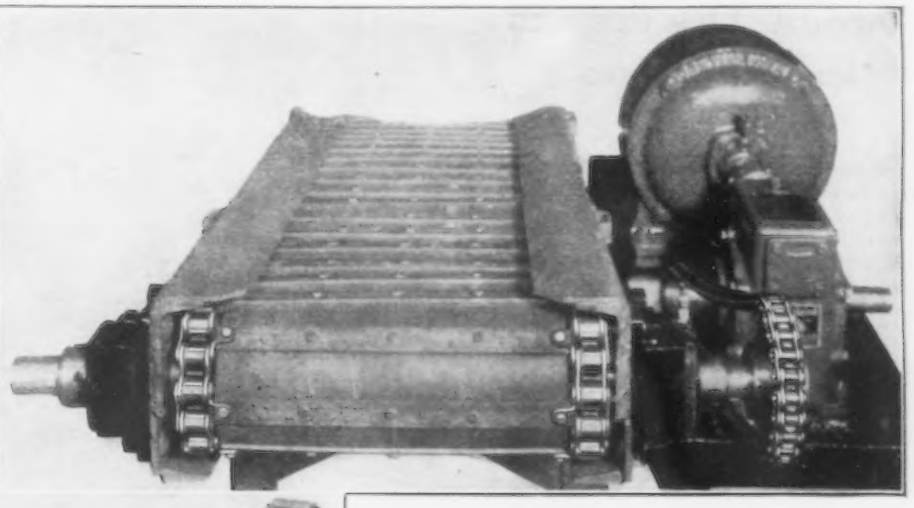
E. C. Sherwood, specialist in steel rails and track materials, and contractors equipment, for many years located at 50 Church Street, New York, has moved to larger offices at 7 Dey Street.

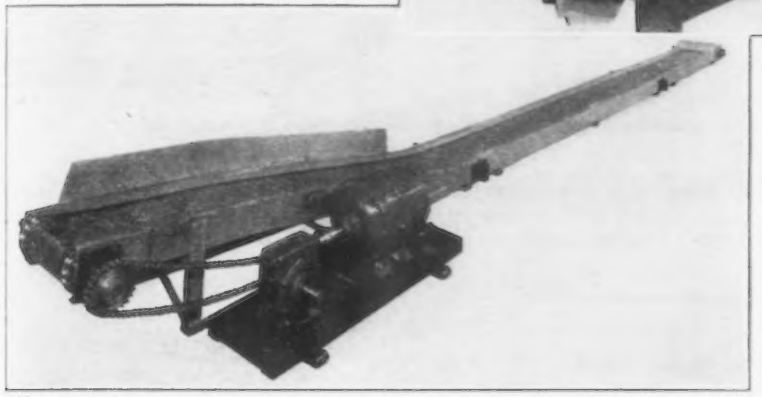
Lincoln Electric Co., Cleveland, has appointed the Great Northern Tool & Supply Co. as its distributer in Montana and Wyoming.

Modine Mfg. Co., Racine, Wis. A 24-page data bulletin prepared for engineers, architects, heating contractors and others interested in application and installation of Modine unit heaters. Capacity tables, variable-speed motor data, pipe size charts and general installation and performance data are given as aids in the intelligent selection and application of these units.

American Cable Co., New York, has licensed the Macwhyte Co., Kenosha, Wis., to manufacture preformed wire rope under the American Cable Co.'s patents.

WHITNEY Roller Chain with sideplate attachments is used on the Meco unit to drive the conveyor belt and sustain the load.





Mechanical Handling

The power drive from the speed reducer is a standard WHITNEY Roller Chain.

can often spell the difference between profit and loss, in the moving of heavy, bulky material; but only when the mechanical unit is built to stand up under continued hard service.

Meco, Incorporated, of Baltimore, Md., recognized this fact when they equipped their armored belt conveyor with WHITNEY Roller Chain drives. They knew that WHITNEY Chains could be depended upon to give the utmost in service under trying conditions.

WHITNEY Roller Chain Drives are used by many manufacturers for their heavy handling jobs and are specified on replacements to give new life to their old equipment.

WHITNEY engineers will gladly work with you on your drive problems. Get in touch with the nearest WHITNEY sales office.

[The Whitney V-95C Roller Chain Catalog will gladly be sent on request.]

THE WHITNEY MFG. CO. HARTFORD, CONN.

SALES AND ENGINEERING OFFICES

BOSTON
The Whitney Mfg. Co.
250 Stuart Street

CHICAGO
The Whitney Mfg. Co.
549 W. Washington Blvd.

NEW YORK
L. C. Biglow & Co., Inc.
250 W. 54th Street

PHILADELPHIA
The Whitney Mfg. Co.
133 S. 36th Street

DETROIT
The Whitney Mfg. Co.
2-240 General Motors Bldg.

CLEVELAND
The Whitney Mfg. Co.
1213 W. Third Street

SYRACUSE
George McPherson
201 Norwood Avenue

SAN FRANCISCO
A. H. Coates Co.
1142 Howard Street

WHITNEY SILENT AND ROLLER CHAIN DRIVES

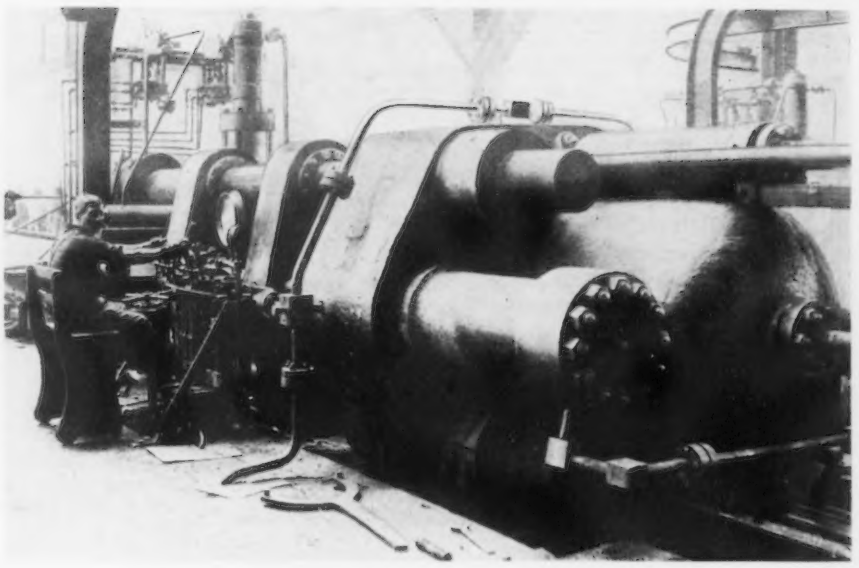
FOR POSITIVE POWER TRANSMISSION

Accurate Dies Required for Rolled Threads

(*Concluded from page* 1059)

between a book and the top of a desk. In reality the process is anything but simple. The dies must be accurately positioned in reference to each other and in reference to the helix angle of the finished screw, or the impression of one will not meet the impression of the other as the thread is rolled. Under the action of the dies the metal of the blank flows to fill the groove in the dies so that the original diameter of the blank is less than the outside diameter of the screw.

The development of a definite size of screw may be explained by assuming that the dies are held firmly at a predetermined distance apart as they pass one over the other and then assuming that different sized blanks are used until one is found just large enough to completely fill the thread contours of the dies. Wherever possible automatic threading machines have been used, the blanks being dumped into a hopper and picked up by an automatic feeding device which delivers them on to the fixed lower die. However, there are some special screws which are still fed by hand.



Massive extrusion machines squeeze the billets into long rods.

Steel Barrels Manufactured by Electric Resistance Welding

(*Concluded from page* 1057)

turn stroke. The tools operate at a speed of 60 linear ft. per min., and reversal of the ram is automatic. In production this machine will keep pace with that of the welding machine.

During the cutting the welded barrel bodies are clamped rigidly ⅜ in. each side of the weld by means of powerful air clamps. Standard tool holders and bits are used and provision is made for convenient adjustment and changing of tools for regrinding, etc. The machine and operators are protected by interlocking safety devices that necessitate proper locating and clamping before the machine can be tripped.

Fig. 5 shows a flash welded steel barrel that, filled with water, had been dropped from a height of 18 ft. on to an 8 x 8 in. timber below. Although distorted and crushed on one side as shown, this barrel sustained an impact force of 10,000 lb. directly on the weld, and showed no signs of leakage even after subsequent tests of a similar nature. Test pieces cut from this barrel showed the following tensile strength, elastic limit, etc.:

	Tensile Strength, Lb. per Sq. In.	Elastic Limit, Lb. per Sq. In.	Elongation 2-in., Per Cent	Reduction in Area, Per Cent
Welded portion..	48,700	32,200	32	65
Unwelded portion	51,200	34,200	33	65

As to cost of welding the steel barrels by the electric resistance method, a careful check on the Federal machine here illustrated revealed that the cost for welding current totaled 1.3c. per barrel. Check of several units in continuous operation showed that electric service, material and labor ranges from 2½c. to 3c. per barrel, not including overhead, which varies, of course, with different plants. In the manufacture of steel barrels by the method described, the cost of production has been reduced to about one-third that by methods previously used, according to most of the plants now using the electric resistance welding process. Resistance welding is being employed with similar advantages in making a wide variety of other iron and steel products.

FIG. 5.—This steel barrel, filled with water, had been dropped directly on the weld from a height of 18 ft. Careful examination showed no sign of leakage.

Early Continuous Rolling of Sheets in Europe

An attempt to roll sheets continuously was made on the continent of Europe as early as 1902, according to James Bryden, Smith & McLean, Ltd., Glasgow. In a paper on the manufacture of steel sheets presented to the West of Scotland Iron and Steel Institute, of which he is vice-president, Mr. Bryden said a mill at Tiplitz, Bohemia, is reported to have rolled sheets up to 50 in. in width in gages of No. 14 to No. 10 and in lengths up to 60 ft.

The plant consisted of two stands of three-high rolls driven through gearing and a finishing train of five stands of two-high rolls. Slab ingots were used and it is believed some difficulty was found in getting uniformity of thickness. "This plant was abandoned in 1907, so it may be assumed that it was not a commercial success."

wer
ecial
d.

wed
and
per
hich
nts.
s by
pro-
bout
usly
ants
nce
ding
van-
of

ng

nu-
of
to
td.,
nu-
to
teel
esi-
ip-
ave
in
in

nds
ugh
five
ots
dif-
rm-
ves
as-
cial